



Building Capabilities-Based Requirements:

*An End-to-End Method
for Defining and Implementing Capabilities*

JFCOM/J8

Joint Interoperability & Integration (JI&I)

C2 Functional Capabilities Board



Who We Are

- JI&I (Joint Interoperability & Integration)
- J85
 - Reviewers of your documents
 - Jointness
 - Interoperability
 - We see about 300 program documents per year
 - Joint Requirements Trainers
 - TRADOC
 - MCCDC
 - AFXOR
 - N81
 - Over 60 programs
- J84
 - C2 Functional Capabilities Board



Who We Are

Our Approach. Help, not hammer!

Partnership
Mentoring
Teaching
Facilitation
Liaison
Coordination





Course Emphasis

- Mission-centric approach to “Capabilities-Based Requirements”
- Problem Solving and Investigation
- Data Mining
- Processes
- Development of DOTMLPF requirements
- Big DOTMLPF - little dotmlpf
- Testability and measurability
- Requirements and function to anchor integrated architecture
- Interoperability & the NR-KPP



Points of Order

- We're not here to debate
- The purpose of this visit
 - Jointness
 - DOTMLPF Requirements
 - 3170 and 3180
 - NR-KPP
- Road to Approval
 - Recommendations
 - Comment
 - Joint perspective
 - DOTMLPF Perspective
 - Speed up the process
 - Ensure you've "made your case"



Introduction:

The Functional Capabilities Board

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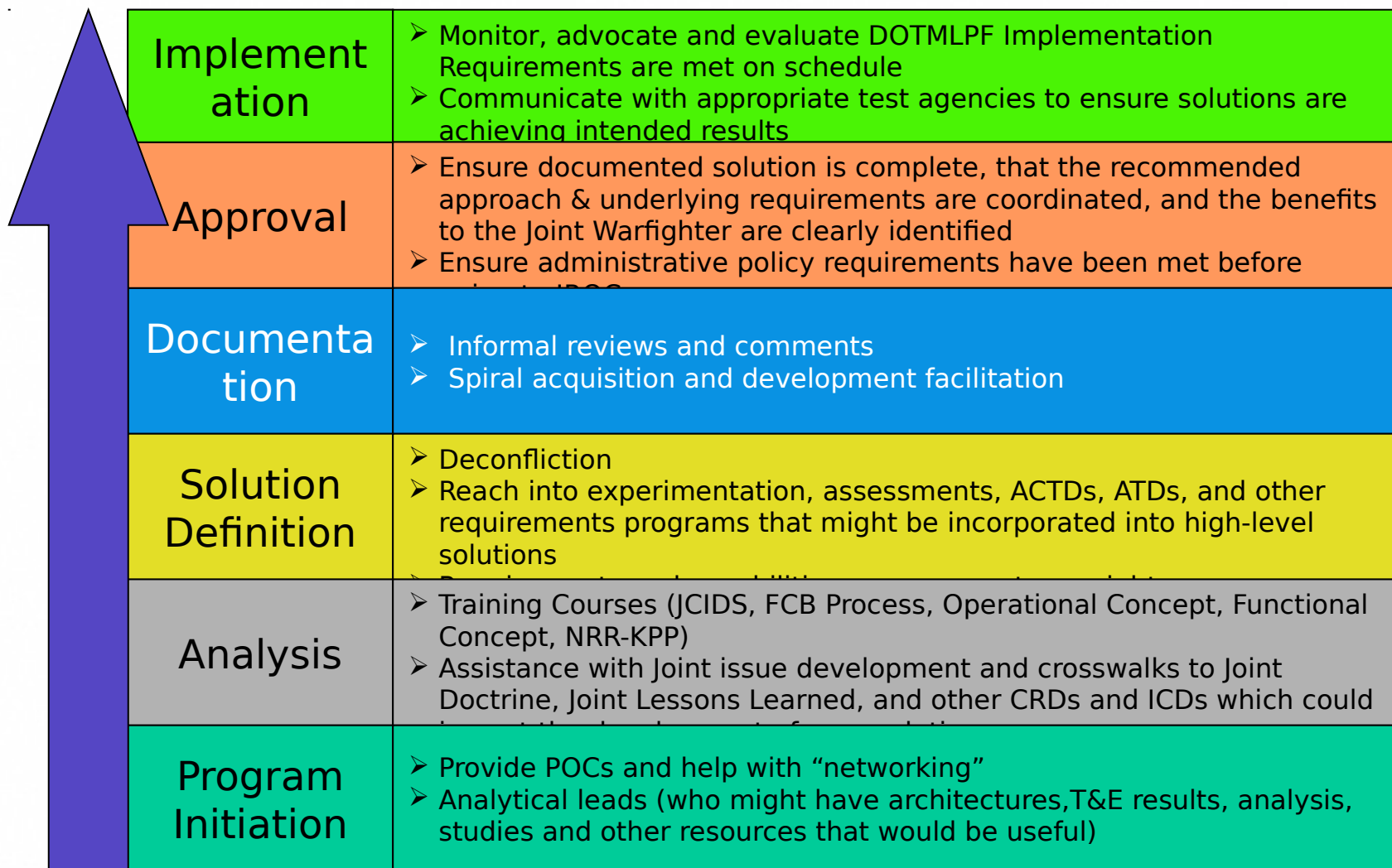


FCB Structure

- Functional Capabilities Board (FCB)
 - FO/GO chair with 0-6 equivalent representatives from Services, COCOMs, Agencies
 - Sponsor Coach / Warfighter Advocate / JROC Advisor
 - Evaluates program on ability to meet joint needs and fill capability gaps
- Formal FCB Working Group
 - Service, COCOMs (at their option), Agency reps
 - Pre-brief prior to formal review by the FCB
 - Evaluates format, content and identifies ALL issues prior presentation to the FCB
 - Proposes FCB Recommendation to JCB
- FCB Working Group (FCB WG)
 - FCB Subject Matter Experts (SMEs) - small subset of the working group above
 - Informal group responsible for shepherding document through the JCIDS and monitoring program development and contribution to the Integrated Architecture
 - Helps sponsors understand and comply with changes policy, etc., during life of the program to ensure success.

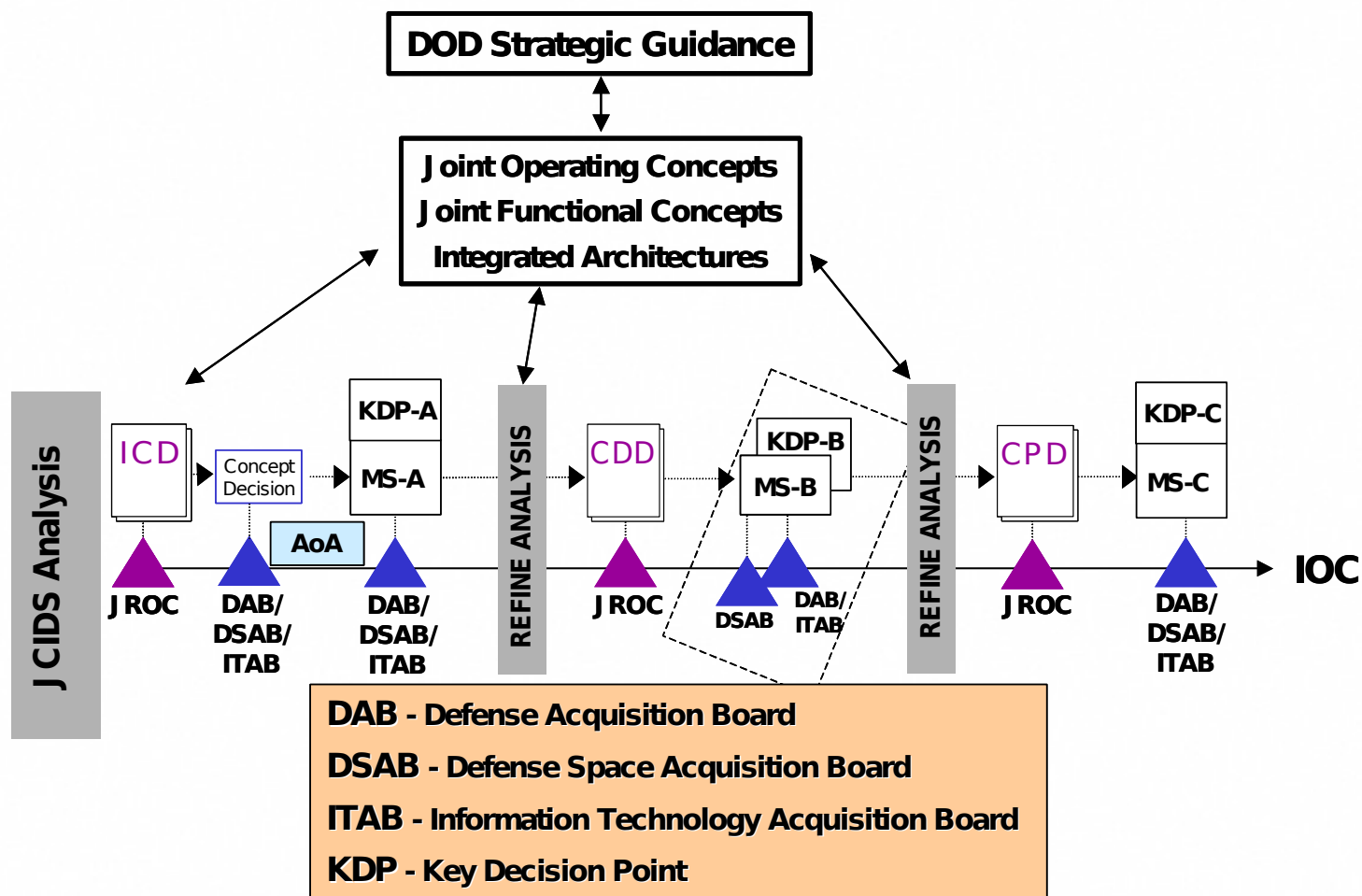


FCB “Help, Not Hammer” Approach





Where FCBs Fit





Where FCBs Fit

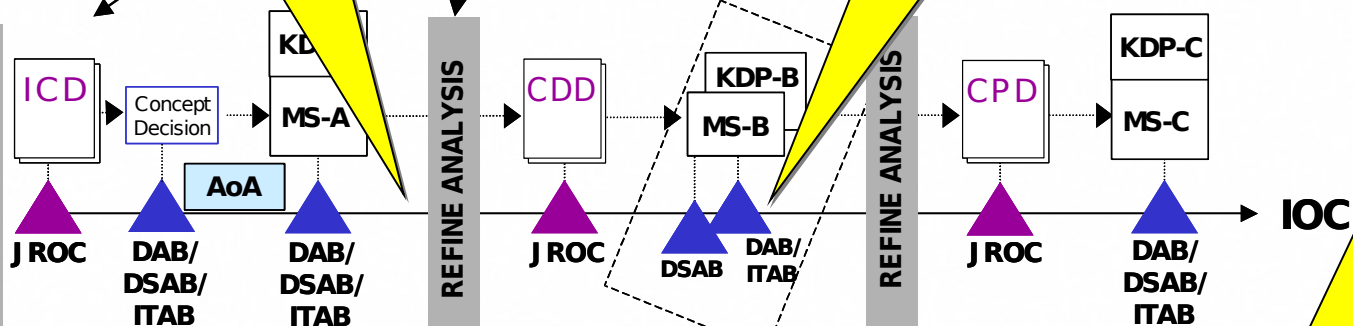
Training, Analysis, Concept, Architecture, Timeline to get to Joint Vision, Progress to Joint Vision

Strategic Guidance

Joint Operating Concepts
Joint Functional Concepts
Integrated Architectures

Analysis, Concept, Architecture, Timeline to get to Joint Vision, Progress to Joint Vision, ACTD migration in POR or new program

ICIDS Analysis

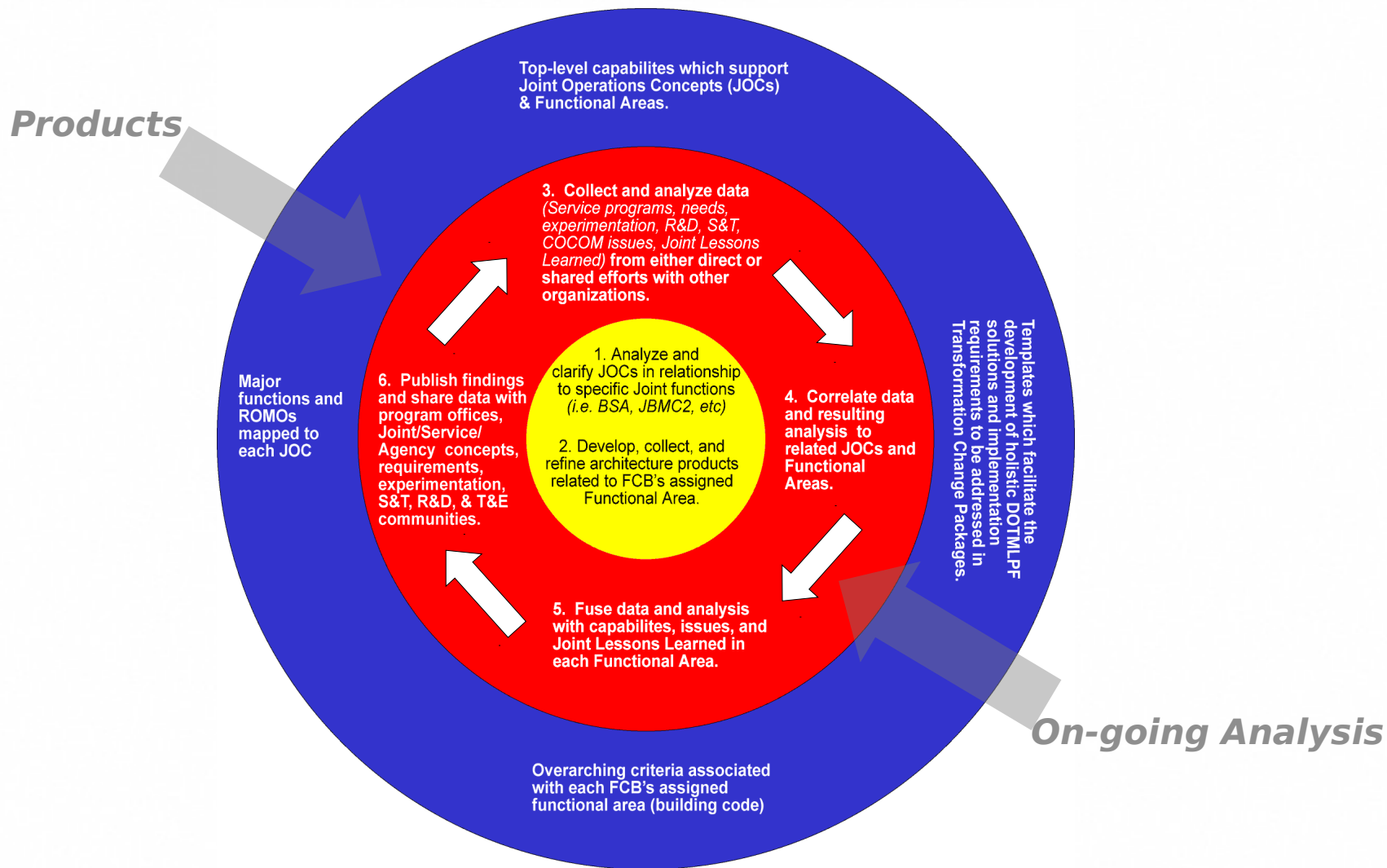


Training, Analysis, Timeline to get to Joint Vision, Assistance with policy changes prior to ICD

Timeline to get to Joint Vision, Progress to Joint Vision, ACTD migration

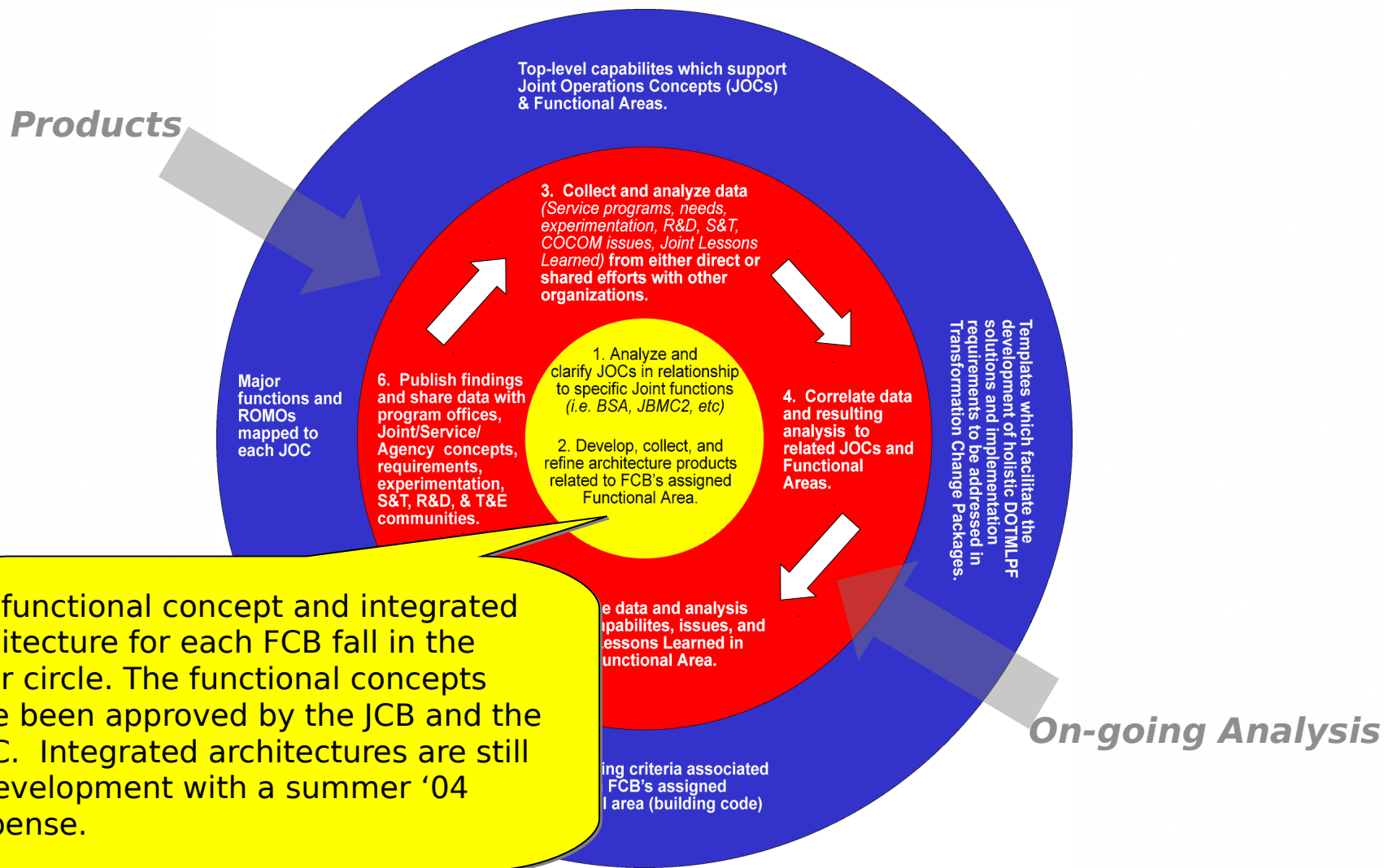


Envisioned Analytical Support



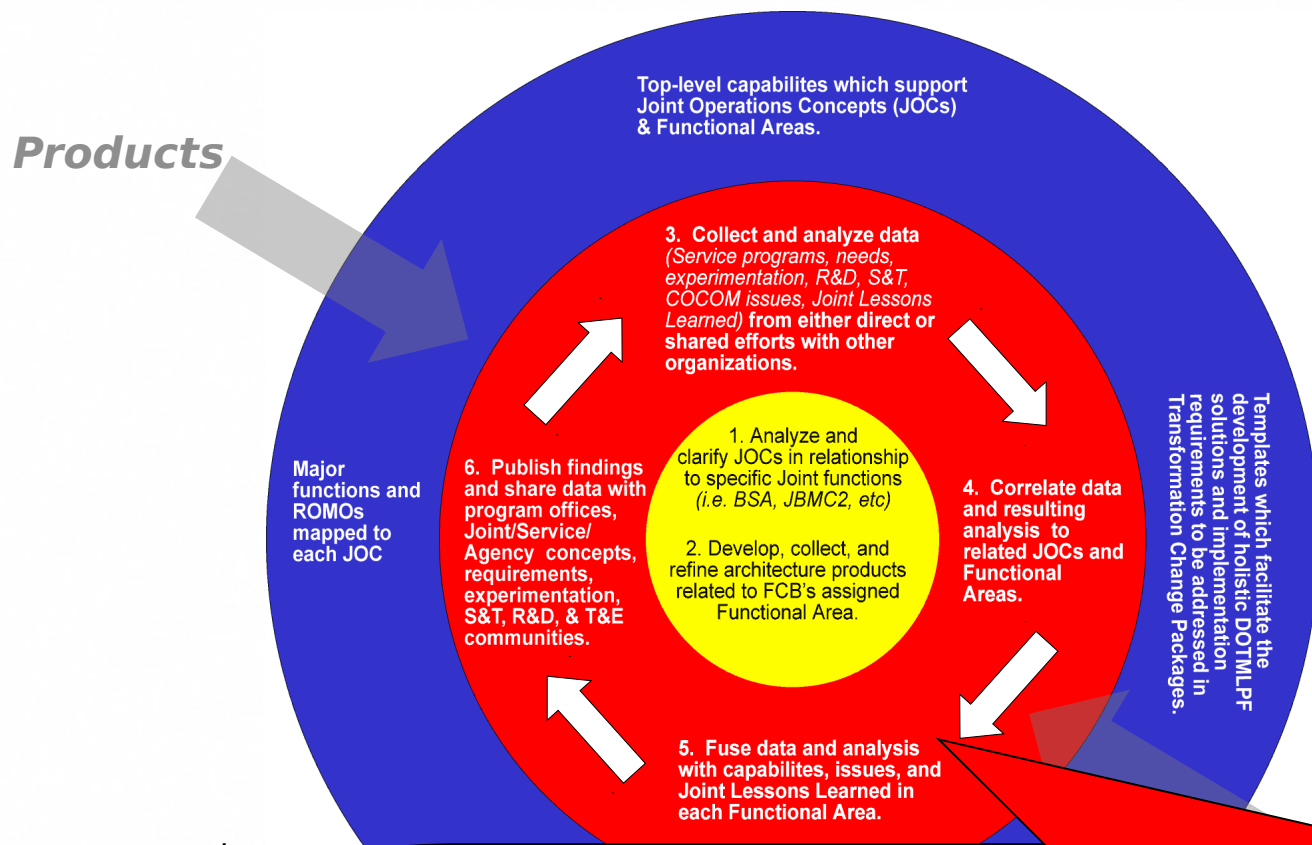


Envisioned Analytical Support





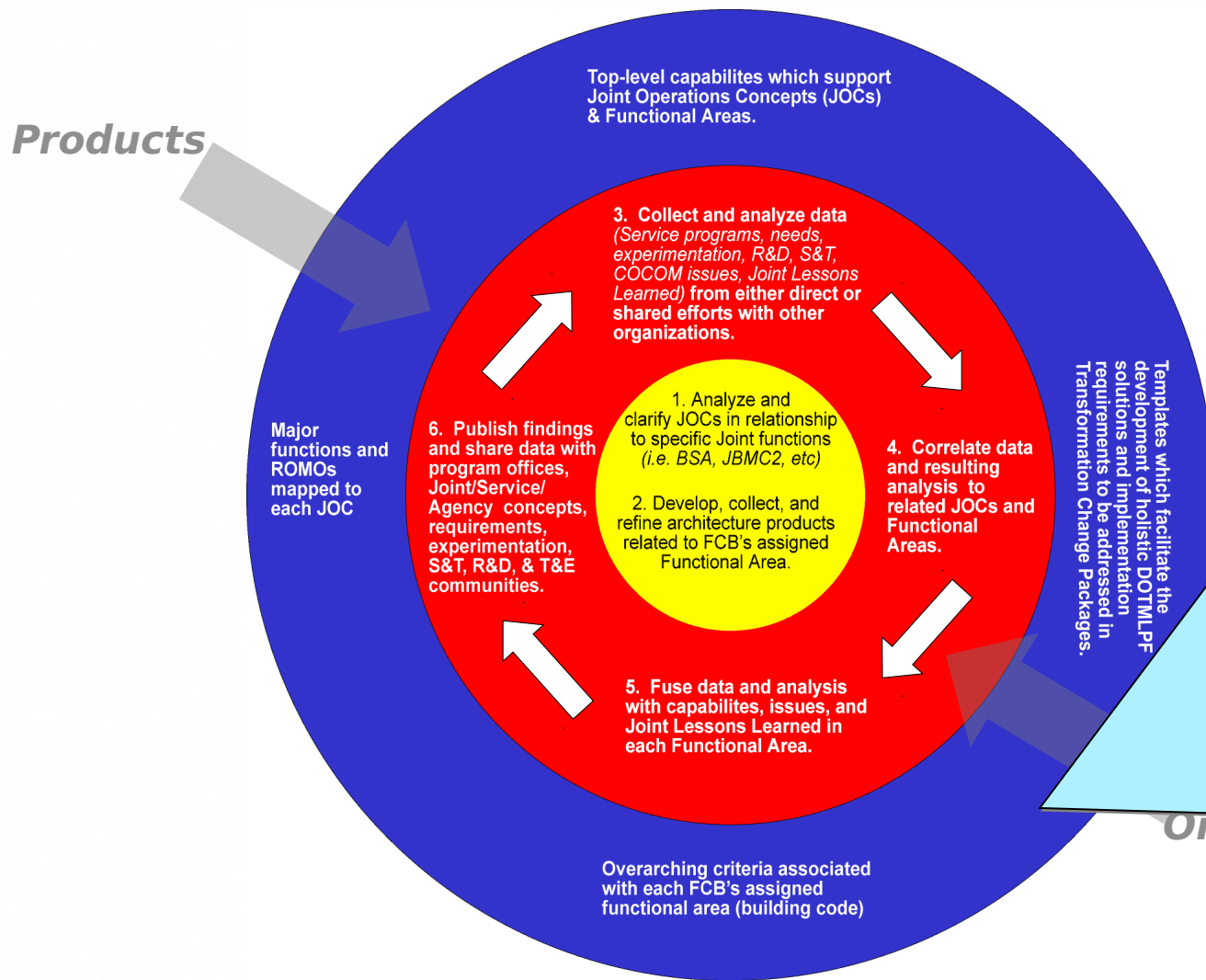
Envisioned Analytical Support



The analytical work to be provided by FCBs isn't at an optimized state. Once architecture products & baselines of current capabilities & future expectations are developed and collected, gap analysis can be performed to highlight shortfalls that require solutions. This ring will feed the outer ring and will be continually updated in conjunction with updates to the concept/architecture when gaps are filled. Timelines established by the concept/architecture and program schedules will allow tracking of status toward the 2015 goal, which in itself will be changing.



Envisioned Analytical Support



The ICDs, CDDs and CPDs aren't just MNSs and ORDs that have been put into the current format. Documents coming through the process still aren't directed into gaps identified by the FCBs. As concepts and architectures become available and the FCBs mature, FCBs will direct sponsors toward the gaps. FCB involvement throughout the process will ensure programs address gaps, leverage existing work, and that products results is the 'right' solution to address Joint warfighter's need.



Introduction:

Foundational Principles

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System of Systems

Commercial Example

Functional Capability:

- Provide public road-based transportation service for people

System of Systems:

- Bus:
 - Vehicles
 - Diesel Pumps
 - Traffic Lights
 - Dispatch Systems
 - Scheduling System



System of System: A set or arrangement of systems that are related or connected to provide a given capability. The loss or any part of the system will degrade the performance or capabilities of the whole.

Military Example

Link 16:

- JTIDS Class 2 terminal
- AEGIS Cruiser
- MIDS terminal
- F18
- JTIDS Class 2 terminal
- AWACS

AEGIS Combat Direction:

- SPY 1 Radar
- Command & Decision Display
- Voice/Data Communications
- Weapons Control
- CEC





Family of Systems

A set or arrangement of independent systems that can be arranged or interconnected in various ways to provide different capabilities. The mix of systems can be tailored to provide desired capabilities dependent on the situation.

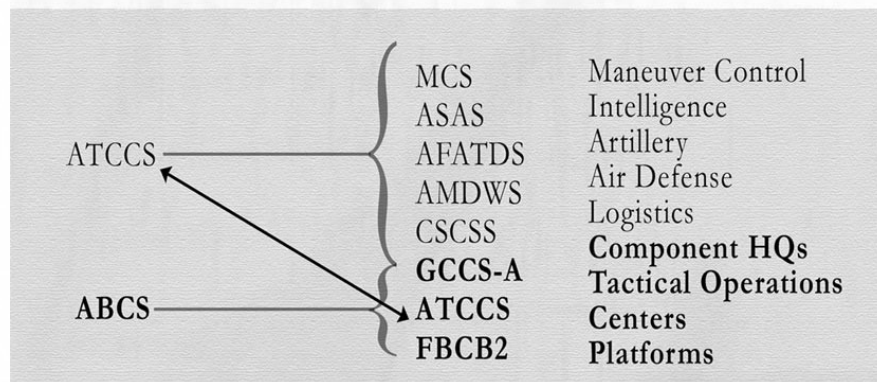
Commercial Example

- Public rail-based system
 - Virginia Rail Express (VRE)
Fredericksburg to Crystal City
 - Metro Rail (Yellow, Orange, Blue, Red, Green)
- Public road-based system
 - DC buses
 - Fairfax Connector
 - Commuter buses
 - Commuter vans
 - School buses
- Private road-based system
 - Privately owned vehicles
 - Taxis
 - Limousines

Military Example

Capability: Gather, process and disseminate information in five functional areas-

Maneuver Control, Intelligence, Artillery, Air Defense, and Logistics.





Symbiosis

Foundational Principles

Operational analysts

- Operational functions
- Operations
- Activities
- Events

Drivers and Barriers

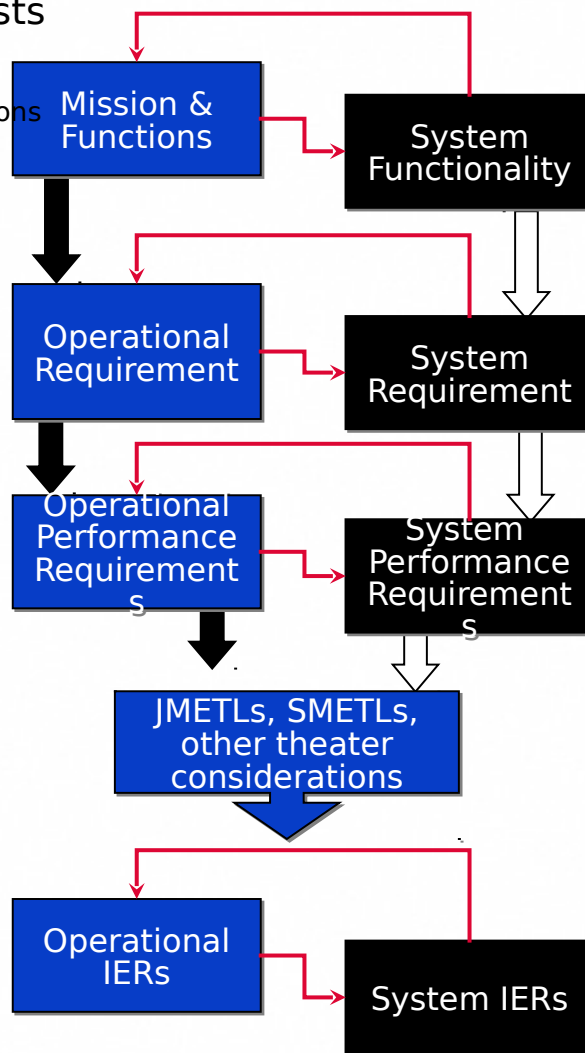
Intelligence Considerations

Human Interface

Battlespace AOR

Interoperability Considerations

- Attributes which directly effect mission performance
- Distance
- Timeliness
- Security
- Survivability



System analysts

- System functionality
- SOS functionality
- FOS functionality & interoperability
- System design

- System attributes and specifications which define HOW the system must perform to support the mission
- Range
- Speed
- Data Integrity
- Hardness

Material Qualities

S&T

Network Considerations

Environmental Considerations

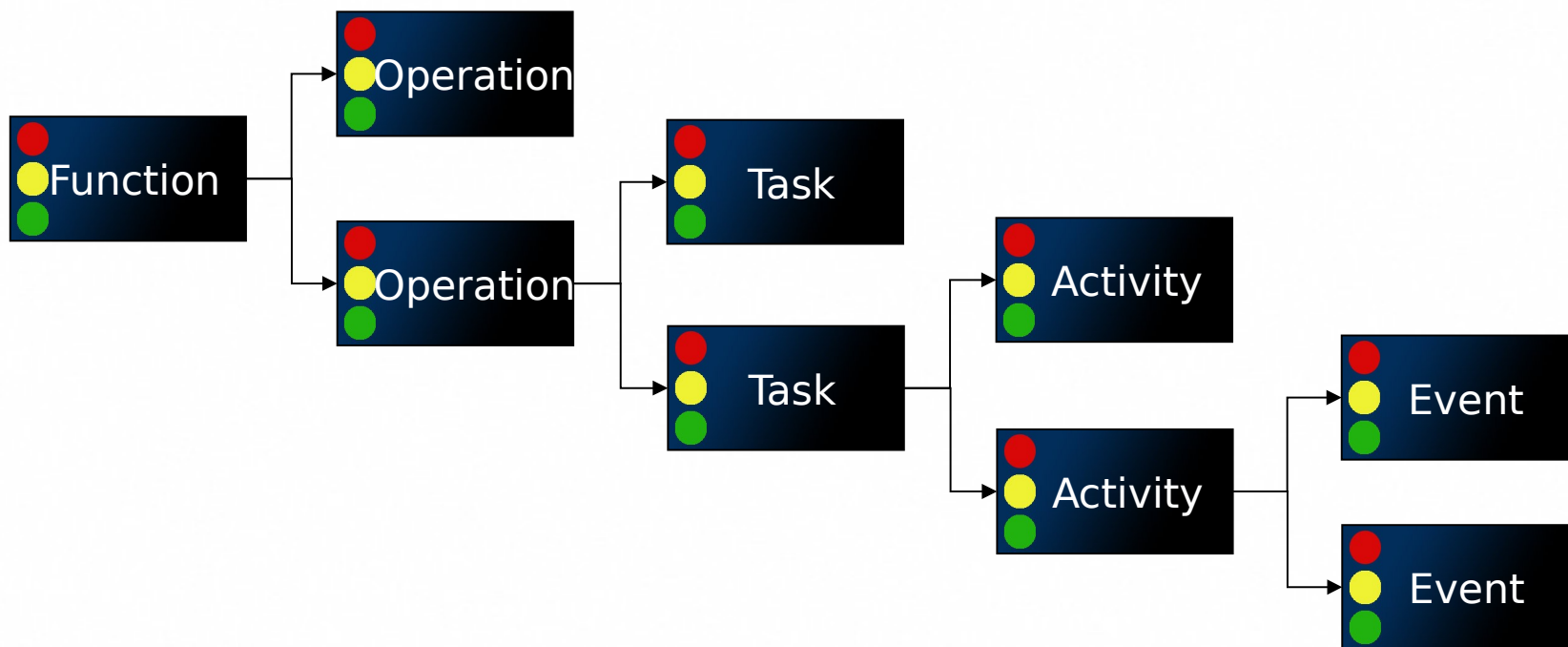
FOS Considerations



Mission Assessment Process

Foundational Principles

Dendritic Model





Interoperability

Foundational Principles

- C4I:
 - Connectivity
 - Processing
 - Protocols and standards
 - Display
 - DOTMLPF
 - Theater FoS Considerations





Introduction

The New 3170 Environment

- May the best man win. You compete.
- You have to make your case to the Functional Capabilities Board.
- How well you address spiral development could mean the difference between getting the nod to go into full production and getting your program canceled.
- No way of getting around the type of analysis that was in the old MNS.
- The answer must address DOTLMPF. Even if you are on the material only path, you will still be required to address all DOTMLPF factors.



Introduction

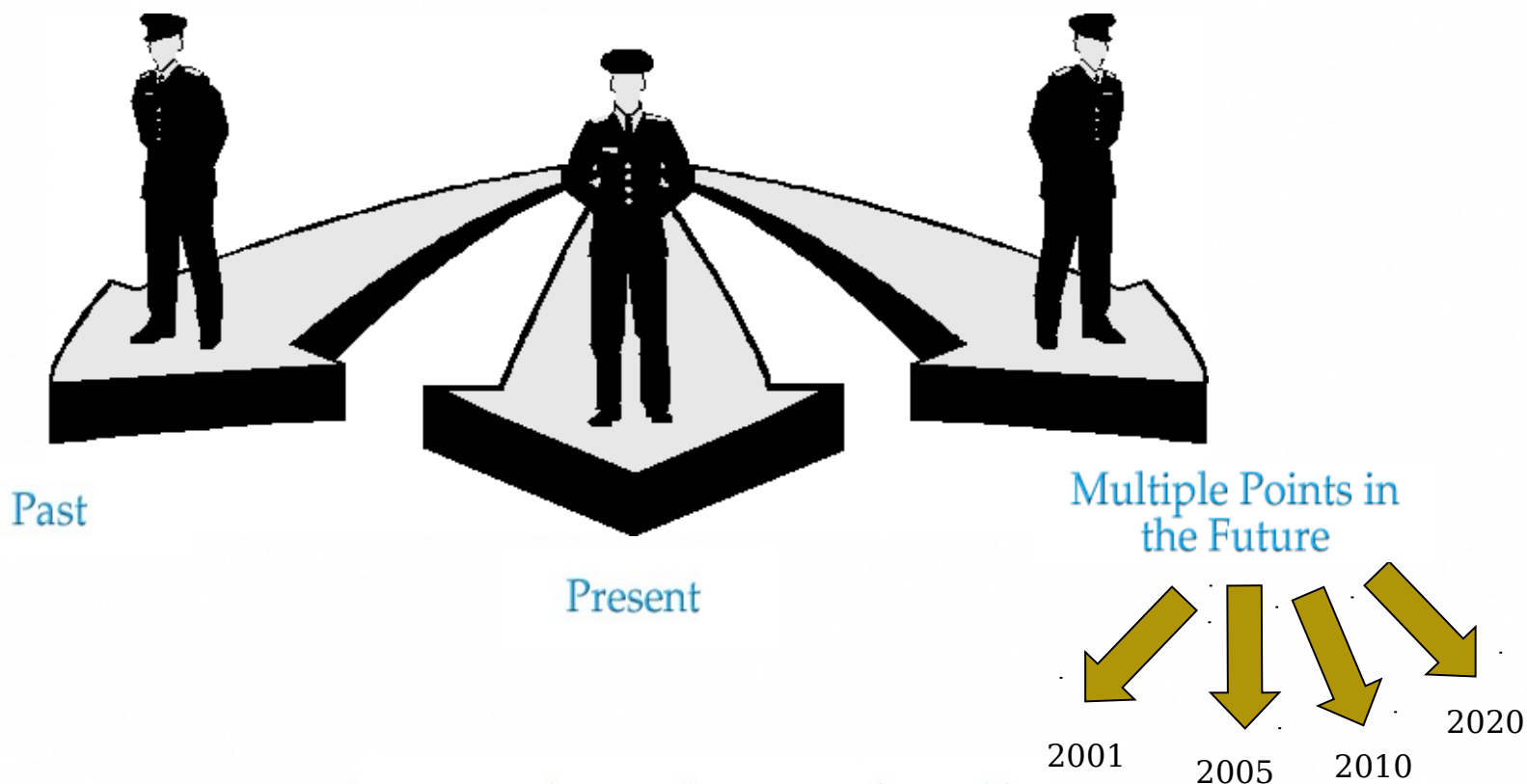
What the Changes Mean

- A capabilities-based requirement is still a requirement
- Capabilities-based requirements are the kind of mission centric requirements the DOD has been talking about since Cohen kicked off the Y2K operational evaluations
- It doesn't matter how many time JCS changes the requirements systems or ASD overhauls the acquisition system, the analytical method to produce these documents hasn't changed
- They don't expect you to define requirements with 100 percent accuracy anymore.. Perfection is no longer the goal. What they want is "the best we can do for now."



Future Requirements = *Future Threat + Future Capabilities*

Future military goals are a moving target. You have to know which point in the future you are aiming for, you must be looking in the direction of your target, and you must continually adjust your sites.



Time doesn't stand still.



Function

- The key to understanding *where a problem is occurring* and initiation of the formulation of architecture views which demonstrate which *mission threads or business processes* are/will be effected is understanding the organization and its component functions.
- Even though the mission of a hospital is provide quality and affordable patient care, Support (sometimes referred as Administrative) is always broken out as a separate set of functions.
- While critical to the accomplishment of the overall mission, support functions and operational functions performance goals are slightly different. *Support functions are judged solely on how well they support the “front line.” Operational functions are judged on the extent they meet command operational objectives.*



Why Function?

The **early** identification of functions and sub-functions will:

- help identify issues
- help establish relationships between issues & requirements, and requirements & operations,
- help establish relationships between operations and Joint Missions and Tasks.



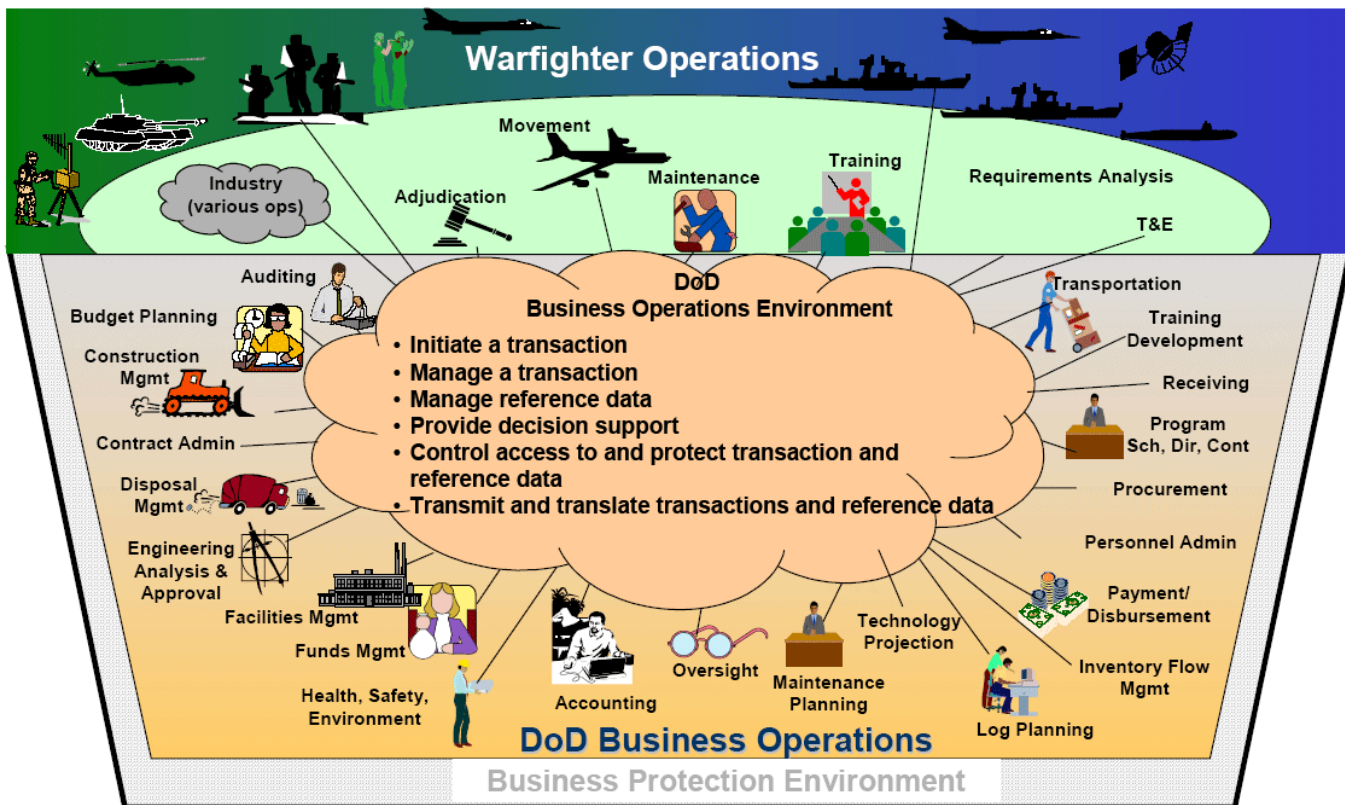
Why Function?

- Understanding functions as they relate to issues and requirements scopes down the effort involved in the requirements generation process
- Helps yield better, more precise documents while reducing time and effort it takes to create those documents
- Makes the requirements generation process more friendly and less threatening to a Requirements “Neophyte”
- The springboard to requirements and associated architecture
- “Conversation starter”
- The bridge between the service/agency view of the world and the Joint vision
- Training wheels
- Critical to understanding a Family of Systems



Why Function?

In a word.... **DOMAINS!**





What is a KPP?

- The 3170 defines Key Performance Parameter as those capabilities or characteristics considered most essential for successful mission accomplishment.
- Failure to meet an ORD KPP threshold can be cause for the concept or system selection to be re-evaluated or the program to be reassessed or terminated. Failure to meet a CRD KPP threshold can be cause for the family-of-systems or system-of-systems concept to be reassessed or the contributions of the individual systems to be reassessed.



Joint Capabilities Integration and Development System:

Process and Format

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MNS versus ICD

MNS

- Talks to mission need
- Looks at non-materiel and materiel alternatives
- Developed bottom-up
- Good forever

ICD

- Captures the analysis
- Framed by common concepts
- What's the desired capability?
- Insufficient analysis gets help
- Evaluates multiple materiel approaches
- Recommends a specific materiel approach
- Addresses a single

Some similarity in content . . .
the difference is in the analysis and the common joint picture



Initial Capabilities Document

- Makes the case for a materiel approach to resolve a specific capability gap
- Defines the capability gap in terms of
 - Functional area(s)
 - Relevant range of military operations
 - Time
 - Obstacles to overcome, &
 - Key attributes with appropriate measures of effectiveness, e.g., distance, effect (including scale), etc.
- Captures the evaluation of different materiel approaches that were proposed to provide the required capability
- Proposes the recommended materiel approach(s) based on
 - Analysis of the relative cost
 - Efficacy (*the power to produce an effect*)
 - Sustainability
 - Environmental quality impacts, &
 - Risk posed by the materiel approach(s) under consideration



Initial Capabilities Document

- How the recommended approach best satisfies the desired joint capability
- Operational context for assessing the performance characteristics of alternatives
- Once approved, not normally updated
- Baseline document for...
 - FoS and SoS approaches
 - Linkages between associated CDDs and CPDs
 - Overarching DOTMLPF aspects necessary to meld the FoS or SoS into an effective capability

The CDD then serves as the *living document* to carry contributing systems and subsequent increments through the SDD phase.



ICD

A tool that provides guidelines and performance standards to help services design, plan for, and budget for systems that function effectively in a Joint environment.

The building code – not the building

What, not how.

Operational features and benefits to the warfighter

Solid Operational Concept to assist the services

A specific, time-phased illustration of your FoS concept & operational concept in action

Universal requirements

DOTMLPF implementation strategy



Components of the ICD

1. Joint Functional Area. Cite applicable functional area(s), JFCs, ROMOs, and timeframe under consideration.

2. Required Capability

- ✓ Describe the particular aspects of the JFCs that the ICD addresses
- ✓ Explain why desired capabilities are essential to joint force commander for achieving military objectives
- ✓ Reference any CRDs (integrated architectures when available) that may be applicable to this ICD.

3. Concept of Operations Summary

- ✓ Describe what mission areas this capability contributes to
- ✓ Operational outcomes it provides
- ✓ Effects it must produce to achieve those outcomes
- ✓ How it benefits the integrated joint warfighter and
- ✓ Enabling capabilities required to achieve desired operational outcomes.

4. Capability Gap

- ✓ Missions & functions that can't be performed or are unacceptably limited (*operational deficiencies*)
- ✓ Linkage between the required capabilities and appropriate JOCs, JFCs, JICs and integrated architectures.
- ✓ Attributes of the desired capabilities in terms of desired effects. Broad descriptions of desired effects help ensure that the required capabilities are addressed without constraining the solution to a specific, and possibly limited, materiel system (*Conditions of Success*).
- ✓ Capability definitions
 - ✓ Must contain required attributes w/ MOEs, e.g., time, distance, effect (including scale) and obstacles to be overcome
 - ✓ *General* enough to not prejudice decisions in favor of a particular means of implementation
 - ✓ *Specific* enough to evaluate alternative approaches to implement the capability

5. Threat/Operational Environment

- ✓ Operational environment in which capability must be exercised
- ✓ Organizational resources that provided threat support to capability development efforts
- ✓ Current & projected threat capabilities (lethal and nonlethal) to be countered
- ✓ Current DIA validated threat documents and Service intelligence production center approved products or data used to support initial JCIDS analysis



Components of the ICD

Functional Solution Analysis Summary

a. DOTMLPF Analysis.

- ✓ Summarize results of DOTMLPF analysis
- ✓ ID changes in US or allied doctrine, operational concepts, tactics, organization, and training that were considered in satisfying the deficiency
- ✓ Describe why DOTMLPF changes were inadequate in addressing the complete capability
- ✓ *Describe DOTMLPF needed to provide the complete capability*

b. Ideas for Materiel Approaches

- ✓ If a materiel solution is required, list materiel approaches considered during the analysis
- ✓ Leverage expertise of components, laboratories, agencies & industry to provide a robust set of divergent materiel approaches that includes single & multi-service, multi-agency, allied & other appropriate FoS or SoS approaches.
- ✓ Indicate potential areas of study for concept refinement.
 - ✓ May include the use of existing and future
 - ✓ US military systems
 - ✓ Allied military systems
 - ✓ Commercial systems, including...
 - ✓ Modified commercial systems or
 - ✓ Product improvements of existing systems.

c. Analysis of Materiel Approaches (AMA)

- ✓ Summarize how well the proposed materiel approaches address capability gaps, using ...
 - ✓ JROC-approved key attributes
 - ✓ MOE of the functional area integrated architecture
- ✓ Address all identified materiel approaches reviewed by the analysis body.
 - ✓ Prioritized list of materiel approaches ranked by how well each provides the capabilities required by the user.
 - ✓ AMA will consider the integrated architecture approved MOE, technological maturity and the overall impact of the solution on the functional and cross-functional areas.
- ✓ Materiel approaches ***are always*** a combination of materiel and non-materiel solutions that deliver the desired capability through an FoS/SoS approach.
- ✓ For FoS/SoS approaches, the analysis will identify the impact of synchronization on the approach.



Components of the ICD

7. Final Material Recommendations

- ✓ Best material approaches based on analysis of ...
 - ✓ Relative cost
 - ✓ Efficacy
 - ✓ Performance
 - ✓ Technology
 - ✓ Maturity
 - ✓ Delivery time frame
 - ✓ Risk
- ✓ Recommendations for further analysis during Concept Refinement and Technology Development
 - ✓ If evolutionary acquisition approach, minimum capability required to fill gap in paragraph 2 of ICD (near term and long term)
 - ✓ If proceeding immediately to milestone B or C, material recommendations proposed to be further analyzed during SDD (System Development and Demonstration)
- ✓ Key boundary conditions within which AoA should be performed
 - ✓ Constraints crafted to allow reasonable compromise between focusing AoA and ensuring AoA considers novel/imaginative alternative solutions
 - ✓ Must reflect thorough understanding of functional/operational areas and conditions under which ultimate system(s) must perform
- ✓ Nonmaterial/DOTMLPF implications/constraints of recommended material approach or approaches

Mandatory Appendices

- ✓ Appendix A - Integrated Architecture Products
 - ✓ Operational View (OV-1)
 - ✓ Others as desired (only those not otherwise presented in document)
- ✓ Appendix B - References
- ✓ Appendix C - Acronym List
- ✓ Other Appendices/Annexes - As required, not otherwise included in body of



Different Material Approaches

- Legacy – Service Life Extension Program
- Legacy – New Production
- Legacy – Modification/Upgrade
- Legacy + new technology
- New Technology – integrate with legacy FoS/SoS



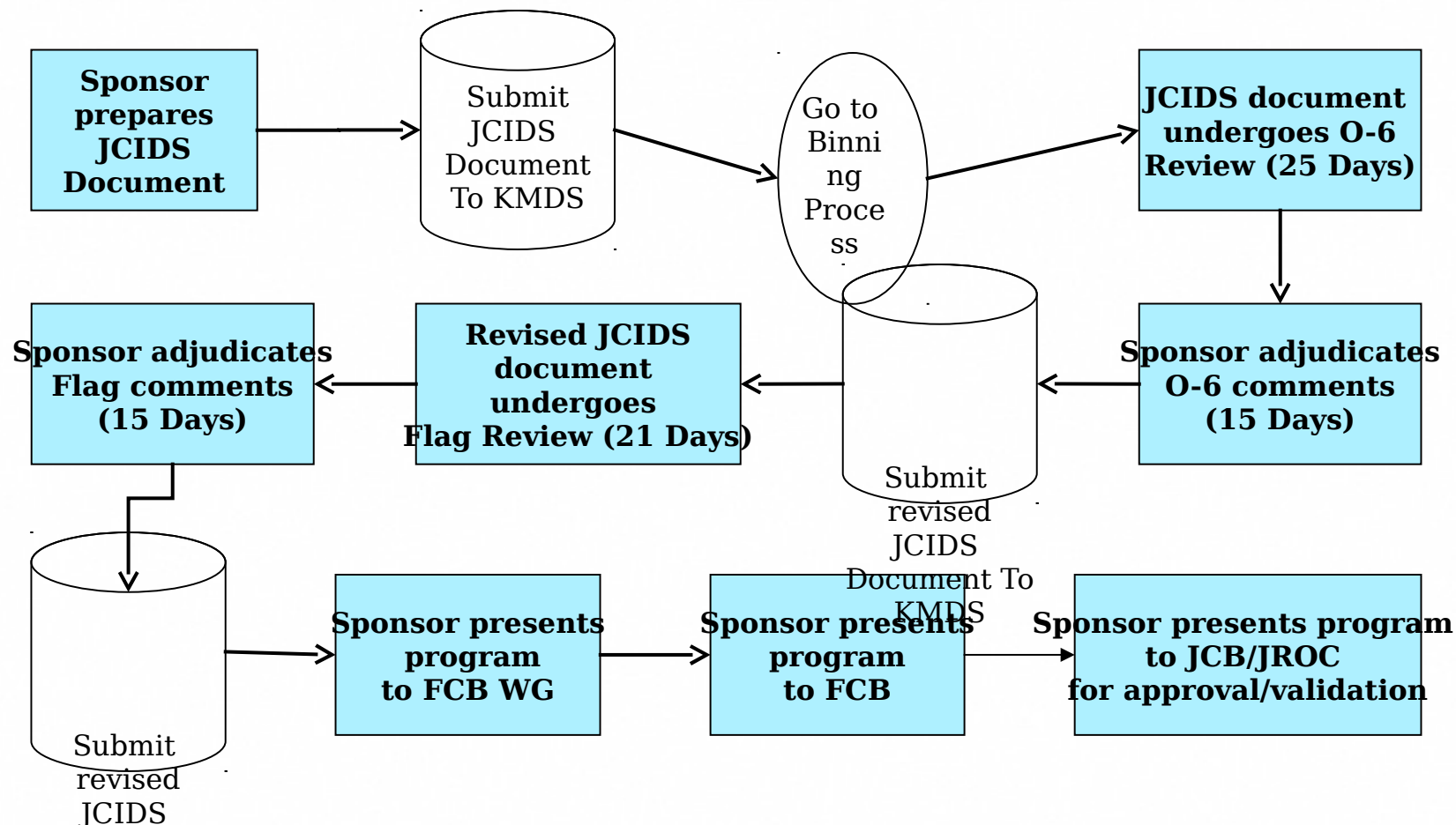
Introduction:

JCIDS Approval Process

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JCIDS Document Approval

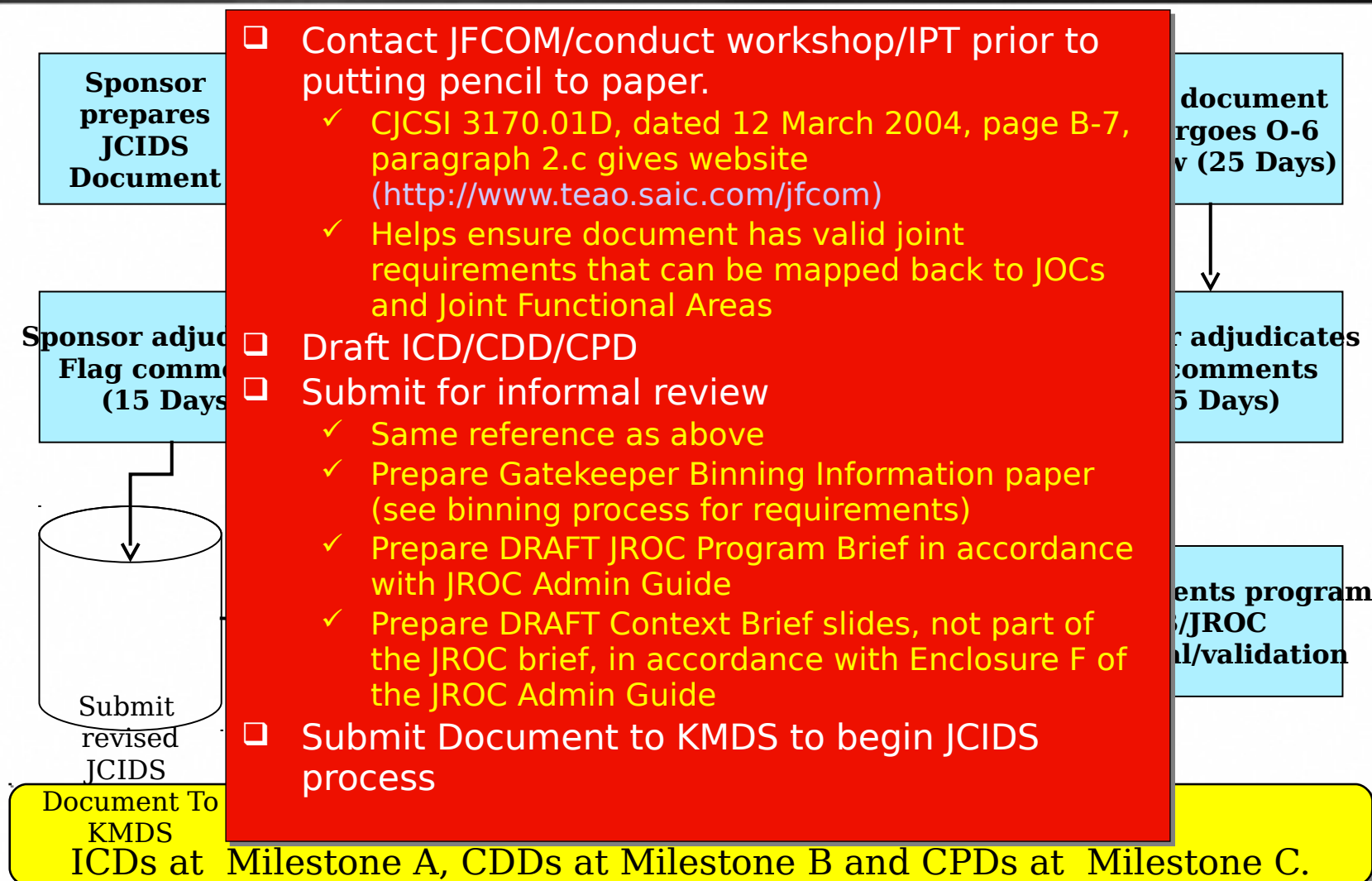


Document To
KMDS

This process is valid for *all* JCIDS documents -
ICDs at Milestone A, CDDs at Milestone B and CPDs at Milestone C.

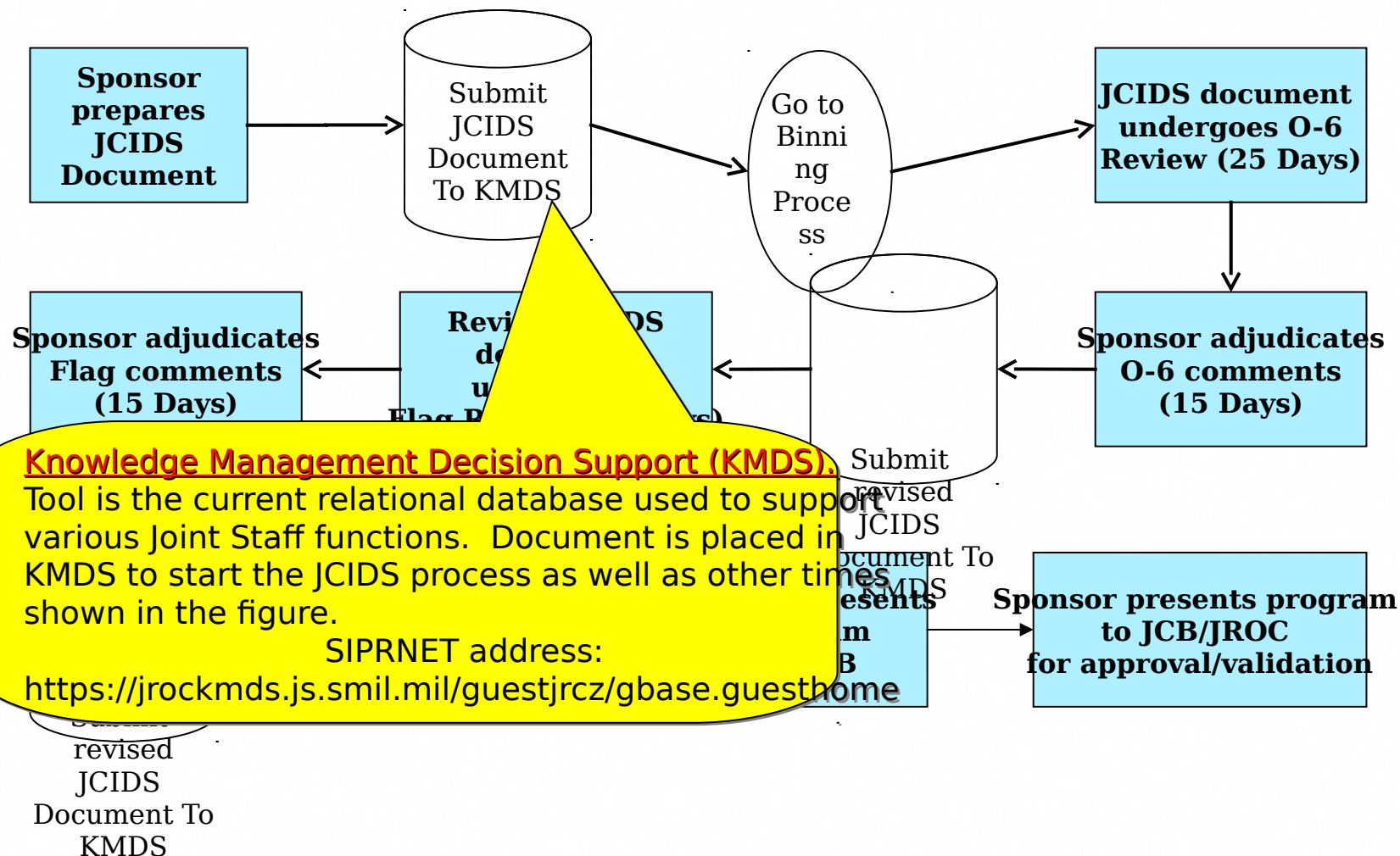


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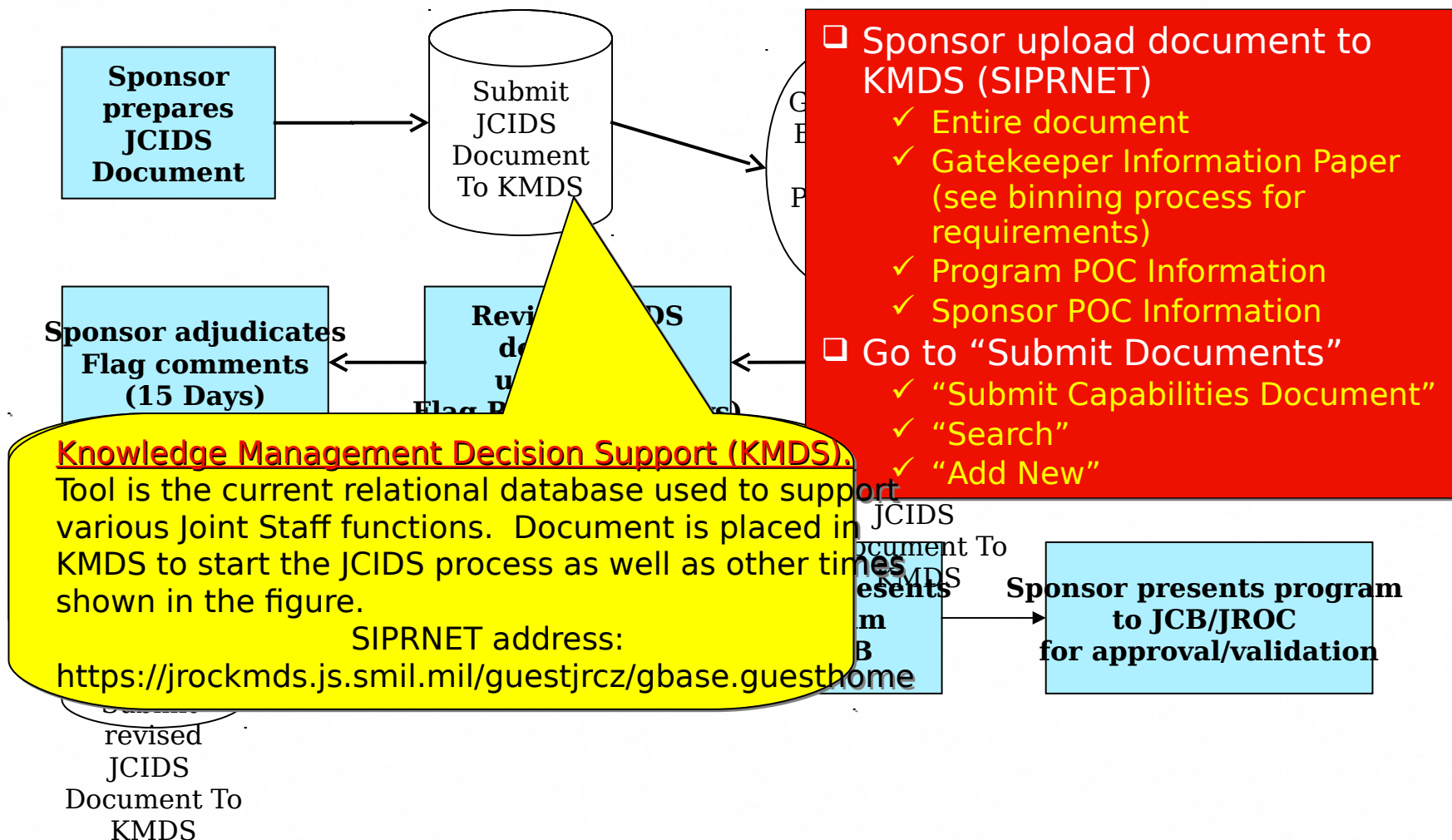


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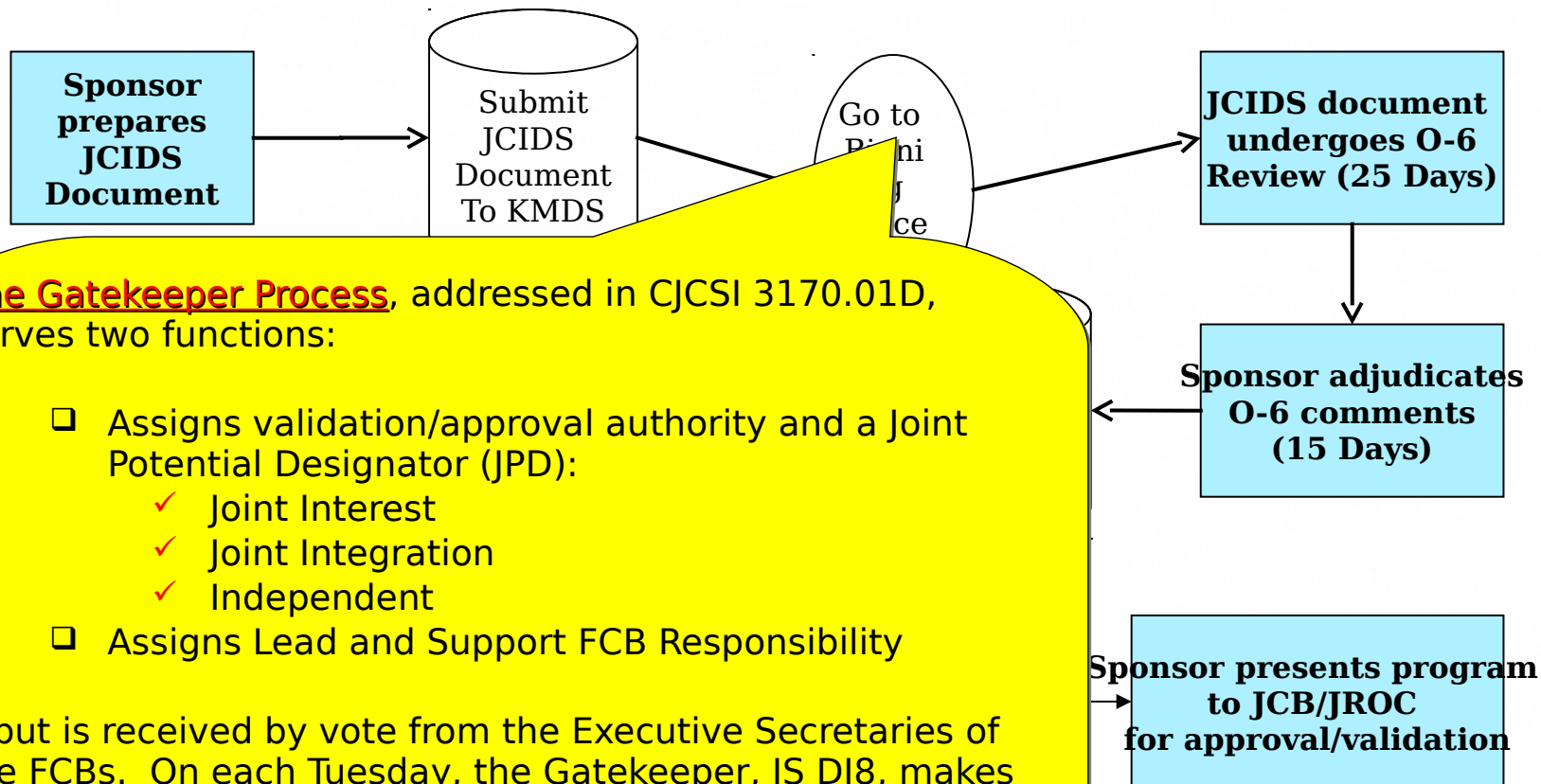


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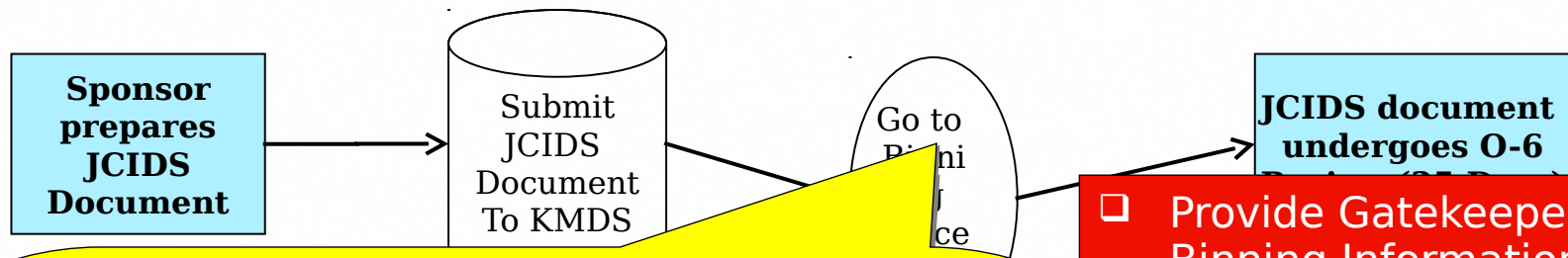


JCIDS Document Approval





JCIDS Document Approval



The Gatekeeper Process, addressed in CJCSI 3170.01D, serves two functions:

- ❑ Assigns validation/approval authority and a Joint Potential Designator (JPD):
 - ✓ Joint Interest
 - ✓ Joint Integration
 - ✓ Independent
- ❑ Assigns Lead and Support FCB Responsibility

Input is received by vote from the Executive Secretaries of the FCBs. On each Tuesday, the Gatekeeper, JS DJ8, makes assignment based on previous week's voting. This is designed to take 5 days.

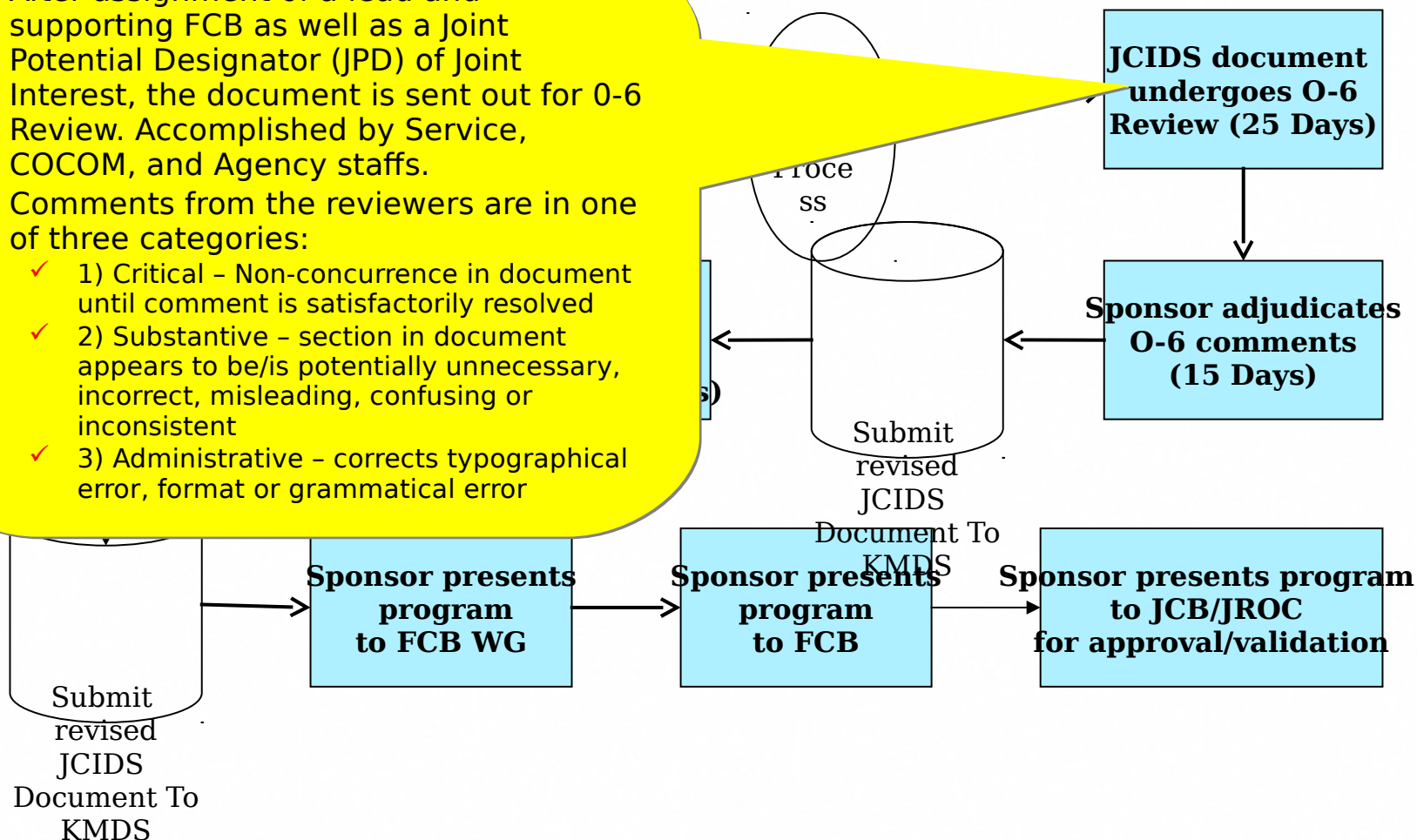
Document to
KMDS

- ❑ Provide Gatekeeper Binning Information paper (Word document) providing the following information (no more than one page):
 - ✓ Title of Program
 - Name
 - Short description (what it is)
 - What it will provide to the warfighter
 - ✓ Why it is coming to the Gatekeeper
 - ✓ What type of analysis has the sponsor done
 - ✓ Name and phone number of a POC that can answer any additional questions



JCIDS Document Approval

- After assignment of a lead and supporting FCB as well as a Joint Potential Designator (JPD) of Joint Interest, the document is sent out for O-6 Review. Accomplished by Service, COCOM, and Agency staffs.
- Comments from the reviewers are in one of three categories:
 - ✓ 1) Critical – Non-concurrence in document until comment is satisfactorily resolved
 - ✓ 2) Substantive – section in document appears to be/is potentially unnecessary, incorrect, misleading, confusing or inconsistent
 - ✓ 3) Administrative – corrects typographical error, format or grammatical error





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Submit
revised
JCIDS
Document To
KMDS

Sponsor presents
program
to FCB WG

JCIDS document
undergoes O-6
Review (25 Days)

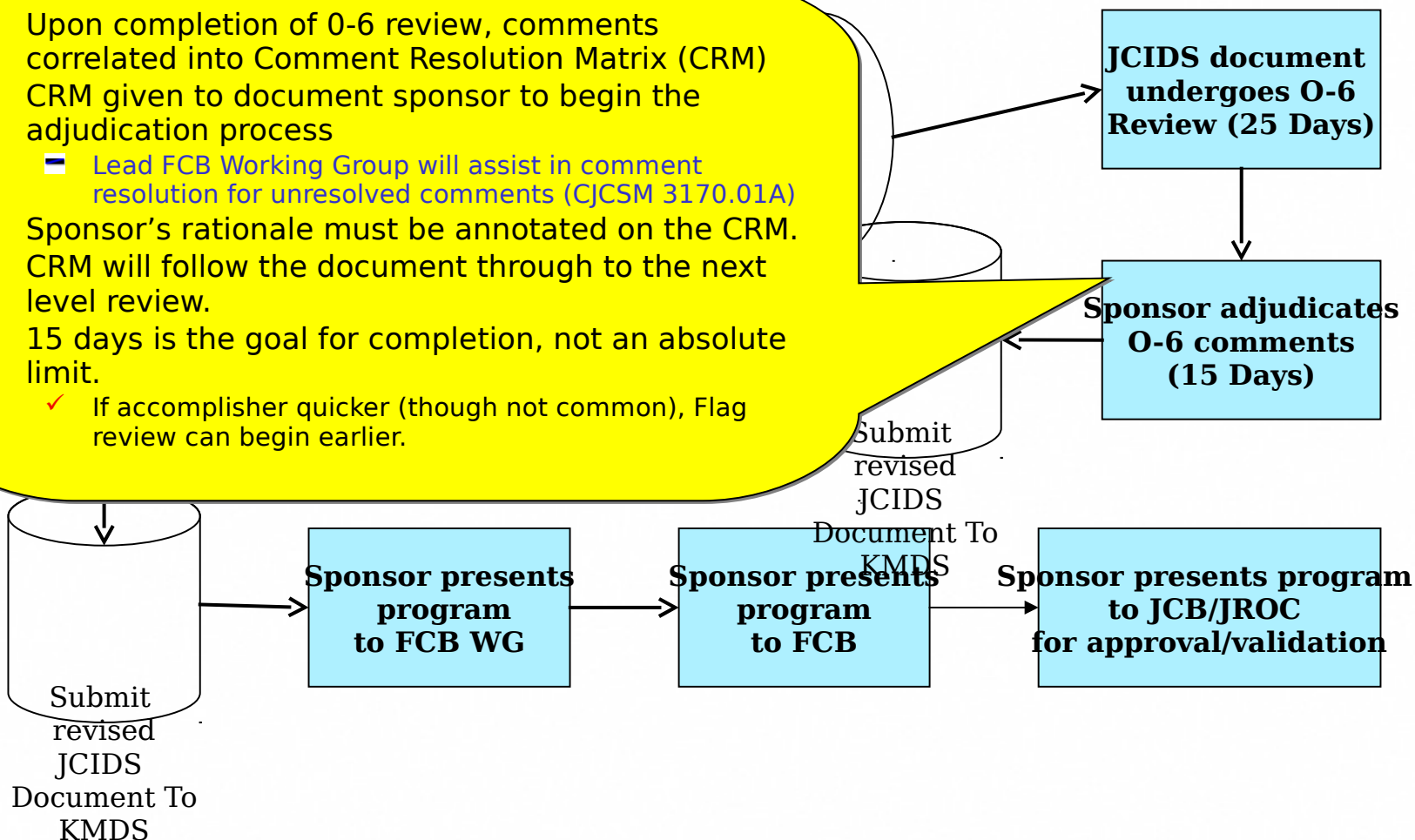
Sponsor adjudicates

- Provide brief, if required, to Supporting FCB
 - ✓ Coordinated through Lead FCB
- Tentatively schedule FCB WG meeting and FCB meeting with FCB Lead
- Review Comments on KMDS to the document during the 25 day cycle
 - ✓ Begin Adjudication through KMDS during review cycle if comments appear on KMDS
 - ✓ Most comments will not be posted until the last days of the review period
- Receive Comment Resolution Matrix (CRM) from JS J8 (via KMDS)



JCIDS Document Approval

- Upon completion of O-6 review, comments correlated into Comment Resolution Matrix (CRM)
- CRM given to document sponsor to begin the adjudication process
 - Lead FCB Working Group will assist in comment resolution for unresolved comments (CJCSM 3170.01A)
- Sponsor's rationale must be annotated on the CRM.
- CRM will follow the document through to the next level review.
- 15 days is the goal for completion, not an absolute limit.
 - ✓ If accomplisher quicker (though not common), Flag review can begin earlier.





JCIDS Document Approval

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- CRM given to document sponsor to begin the adjudication process
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- CRM will follow the document through to the next level review.
- 15 days is the goal for completion, not an absolute limit.

✓ If accomplisher quicker review can begin earlier

JCIDS document undergoes O-6 Review (25 Days)

Sponsor adjudicates O-6 comments

Submit revised JCIDS Document To KMDS

Sponsor
to

□ Contact reviewer to address comments on the CRM

✓ Fill in Sponsor section of the CRM with one of the responses below:

- Accepted - Sponsor accepts comments and incorporates into the document
- Partially Accepted - Sponsor accepts some of the comment with rationale for what will be incorporated into the document to address comment
- Rejected - Sponsor will not incorporate the comment with rationale

□ Highlight all changes to the document for next review

□ Attempt to resolve all comments

✓ Contact Lead FCB Working Group for assistance in resolving unresolved comments



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graph TD
 A[Submit revised JCIDS Document To KMDS] --> B[Sponsor presents program to FCB WG]
 B -- "Flag Review (21 Days)" --> A
 B --> C[Sponsor presents program to FCB]
 C -- "Submit revised JCIDS Document To KMDS" --> A
 C --> D[Sponsor presents program to JCB/JROC for approval/validation]
 D -- "Sponsor adjudicates O-6 comments (15 Days)" --> E[Submit revised JCIDS Document To KMDS]
 E -- "Submit revised JCIDS Document To KMDS" --> A

```
- Submit revised JCIDS Document To KMDS
- Sponsor presents program to FCB WG
- Flag Review (21 Days)
- Sponsor presents program to FCB
- Submit revised JCIDS Document To KMDS
- Sponsor presents program to JCB/JROC for approval/validation
- Sponsor adjudicates O-6 comments (15 Days)
- Submit revised JCIDS Document To KMDS
- Annotated with sponsor comments



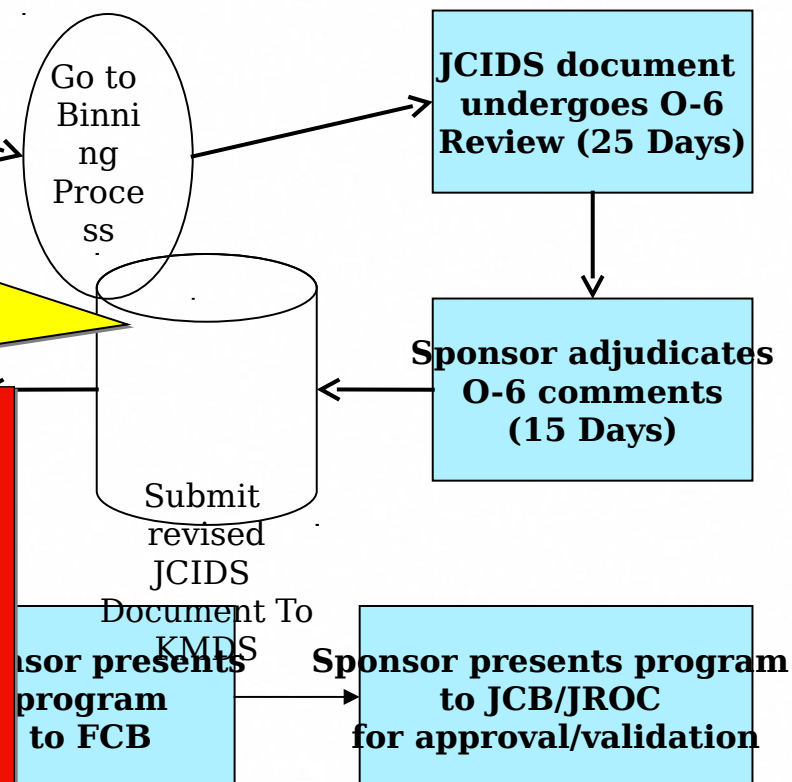
# JCIDS Document Approval

- 0-6 comments addressed
- Revised document is submitted to KMDS to be staffed for Flag Level Review.
- This revised Flag document (with comments made to original) submitted with the 0-6 CRM

✓ Annotated with sponsor comments

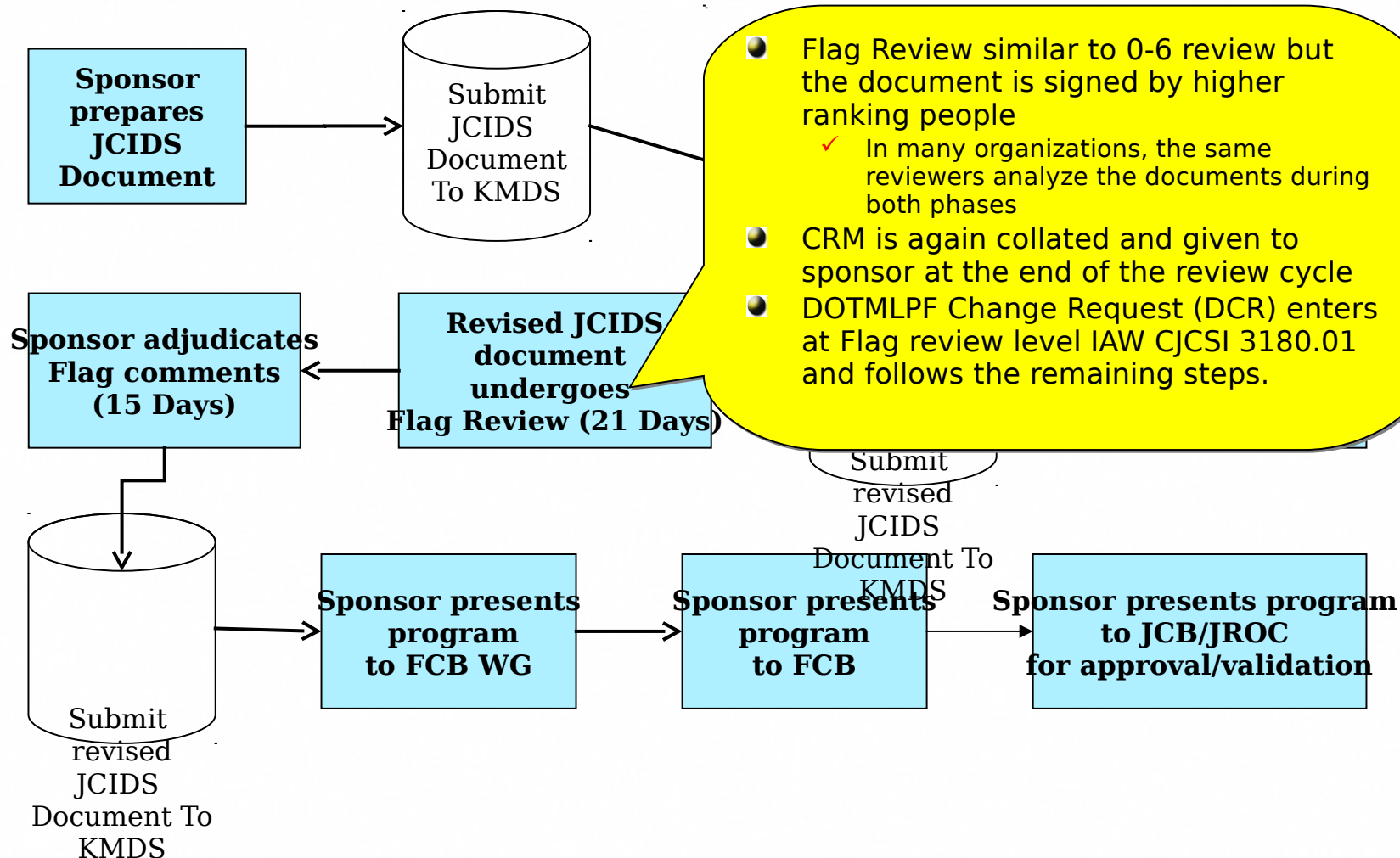
- ❑ Submit Flag document with 0-6 Review comments incorporated
  - ✓ All changes to the document made after 0-6 review highlighted
- ❑ Submit 0-6 Review complete CRM with Sponsor comments included
  - ✓ Go to "Submit Documents"
    - "Submit Capabilities Document"
    - "Search"
    - "Add New"

JCIDS  
Document To  
KMDS



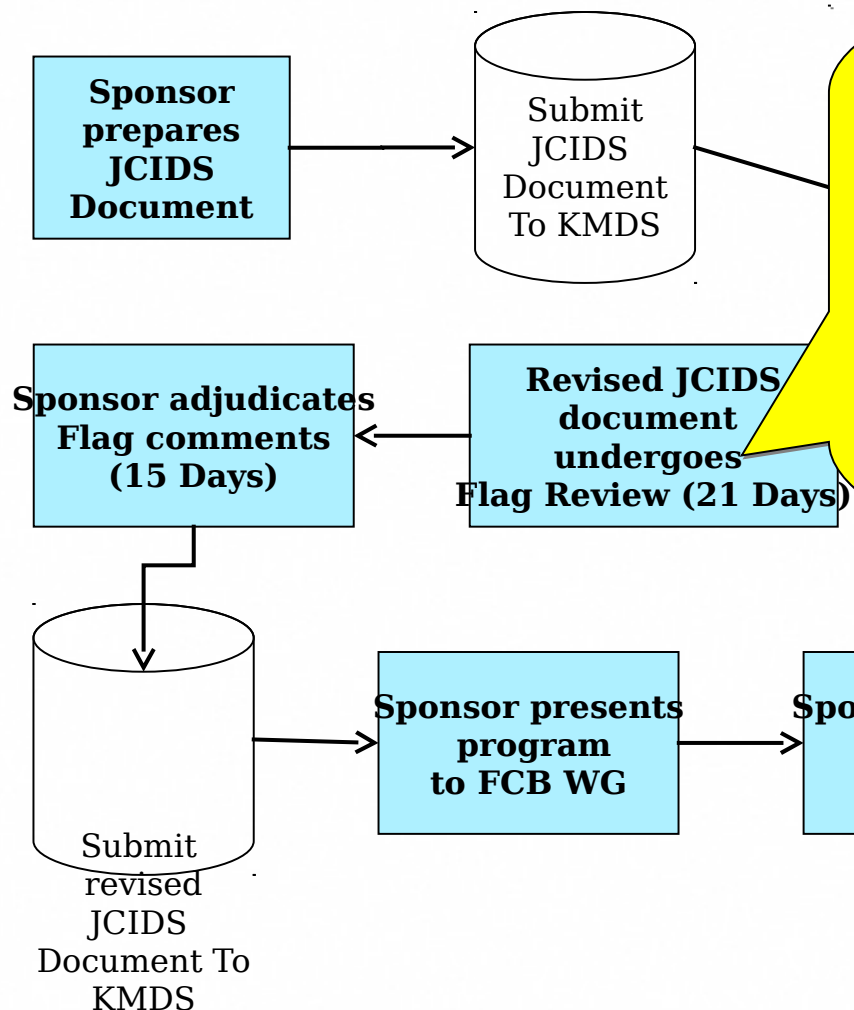


# JCIDS Document Approval





# JCIDS Document Approval

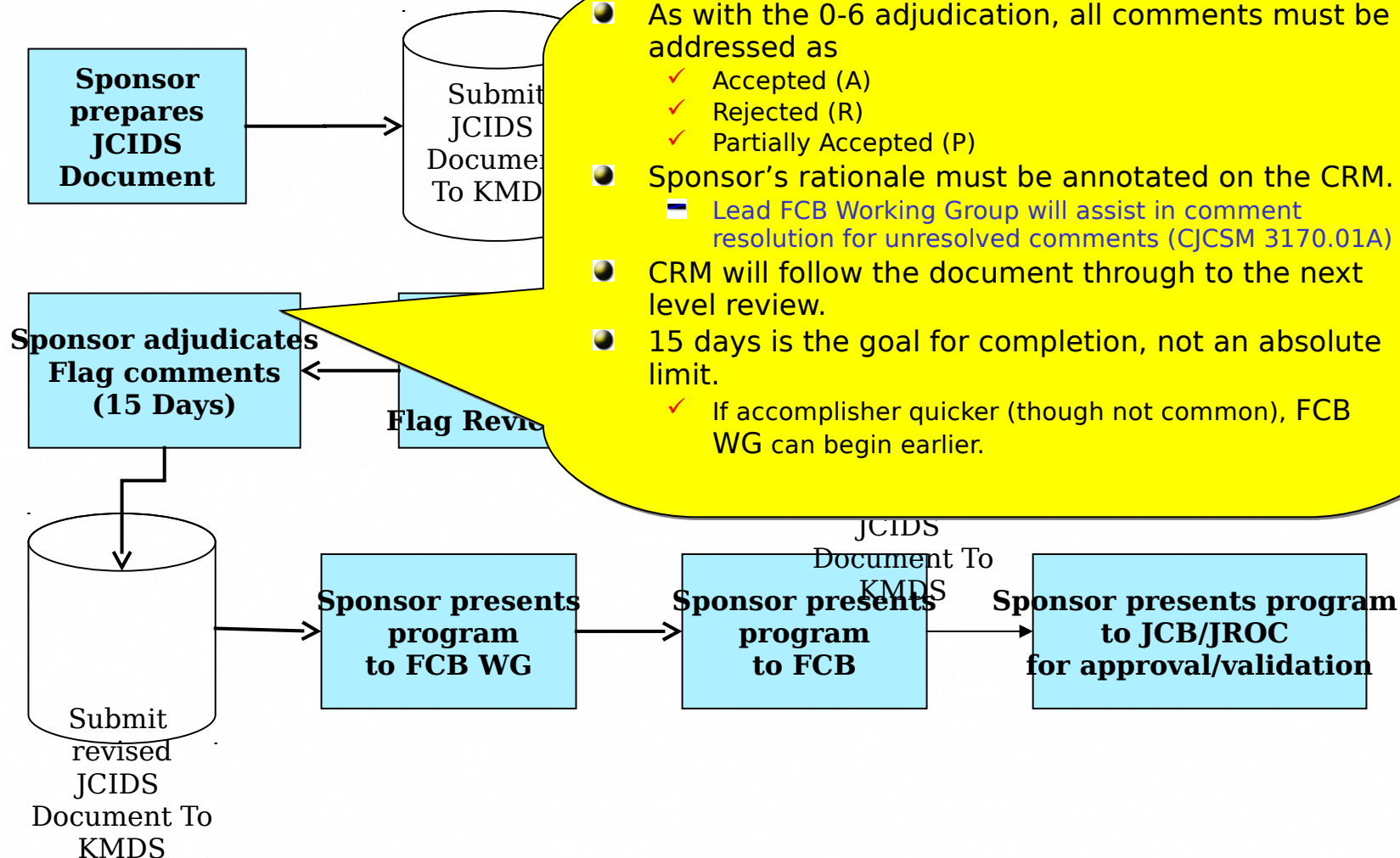


- Flag Review similar to O-6 review but the document is signed by higher ranking people
  - ✓ In many organizations, the same reviewers analyze the documents during both phases
- CRM is again collated and given to sponsor at the end of the review cycle
- DOTMLPF Change Request (DCR) enters at Flag review level IAW CJCSI 3180.01 and follows the remaining steps.

- Incorporate any changes to JROC brief based on CRM and briefing with Supporting FCB
- Update schedule date for FCB WG meeting and FCB meeting with FCB Lead
  - ✓ Functions of KMDS also require tentative dates for JCB and JROC

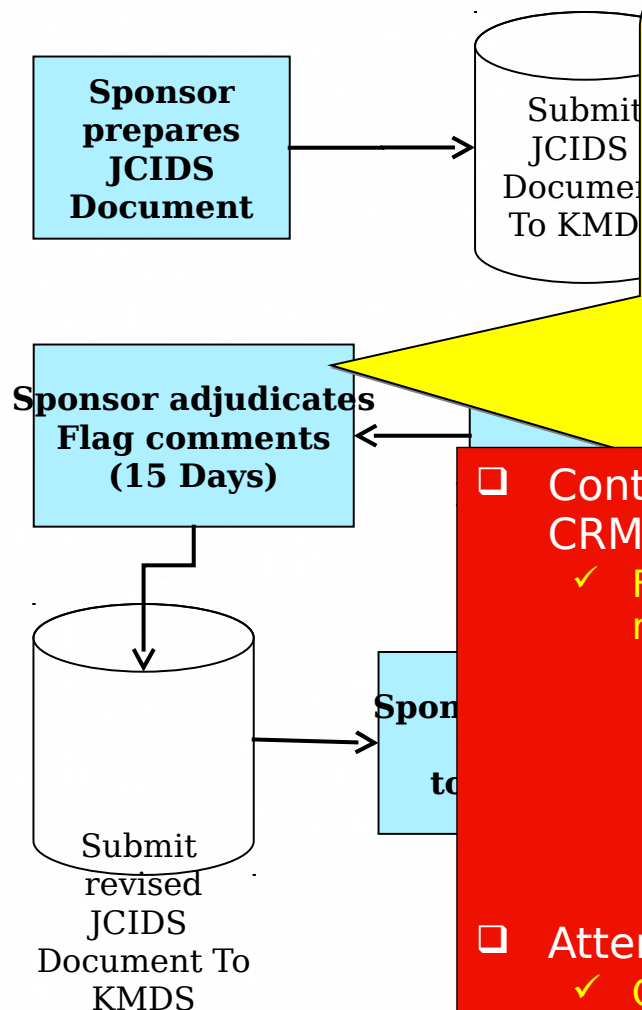


# JCIDS Document Approval





# JCIDS Document Approval

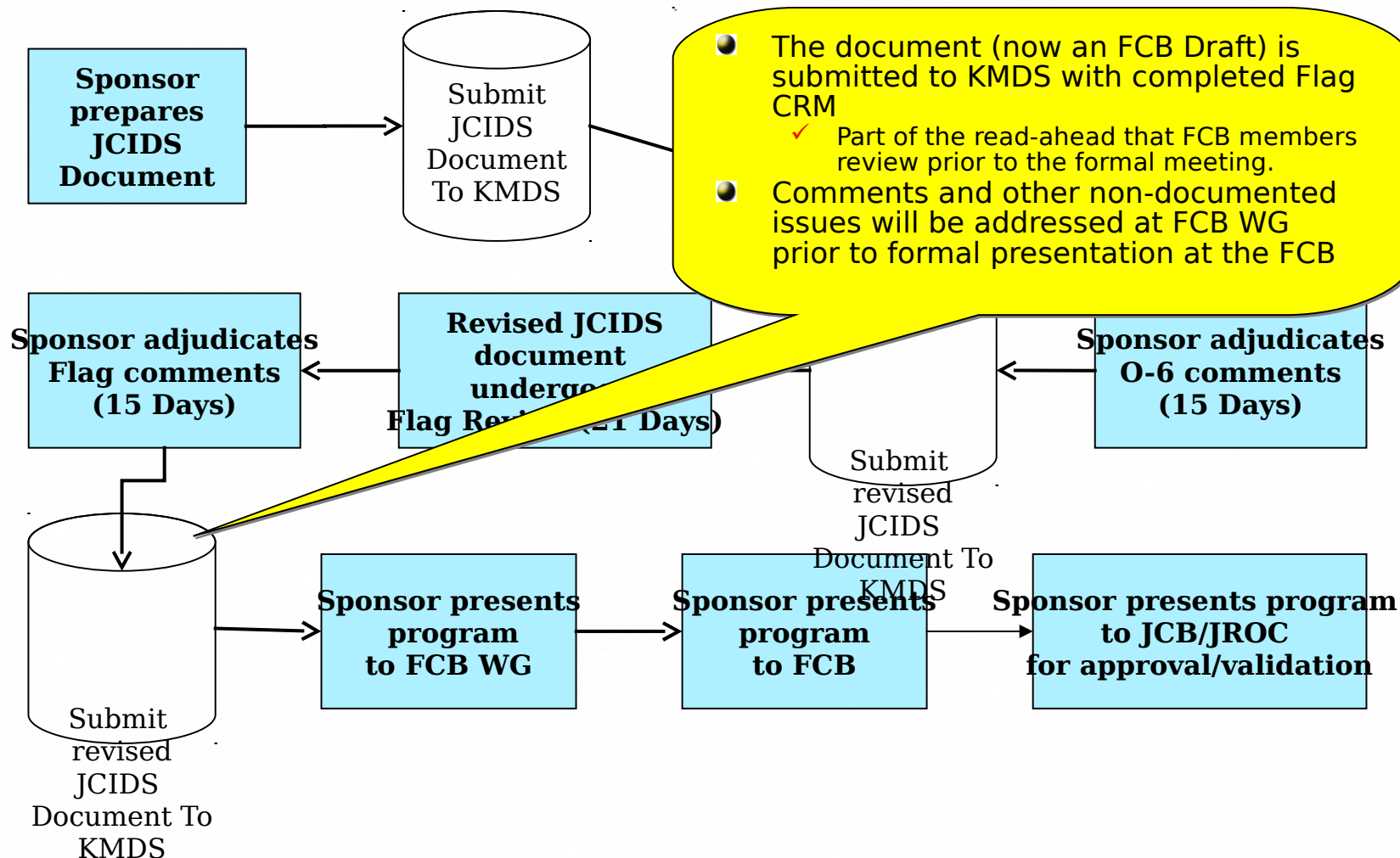


- As with the 0-6 adjudication, all comments must be addressed as
  - ✓ Accepted (A)
  - ✓ Rejected (R)
  - ✓ Partially Accepted (P)
- Sponsor's rationale must be annotated on the CRM.
  - Lead FCB Working Group will assist in comment resolution for unresolved comments (CJCSM 3170.01A)
- CRM will follow the document through to the next level review.
- 15 days is the goal for completion, not an absolute limit.
  - ✓ If accomplished quicker (though not common), FCB

- Contact reviewer to address comments on the CRM
  - ✓ Fill in Sponsor section of the CRM with one of the responses below:
    - Accepted - Sponsor accepts comments and incorporates into the document
    - Partially Accepted - Sponsor accepts some of the comment with rationale for what will be incorporated into the document to address comment
    - Rejected - Sponsor will not incorporate the comment with rationale
- Attempt to resolve all comments
  - ✓ Contact Lead FCB Working Group for assistance in resolving unresolved comments
  - ✓ Required to resolve critical comments or forward to FCB/JCB/JROC)

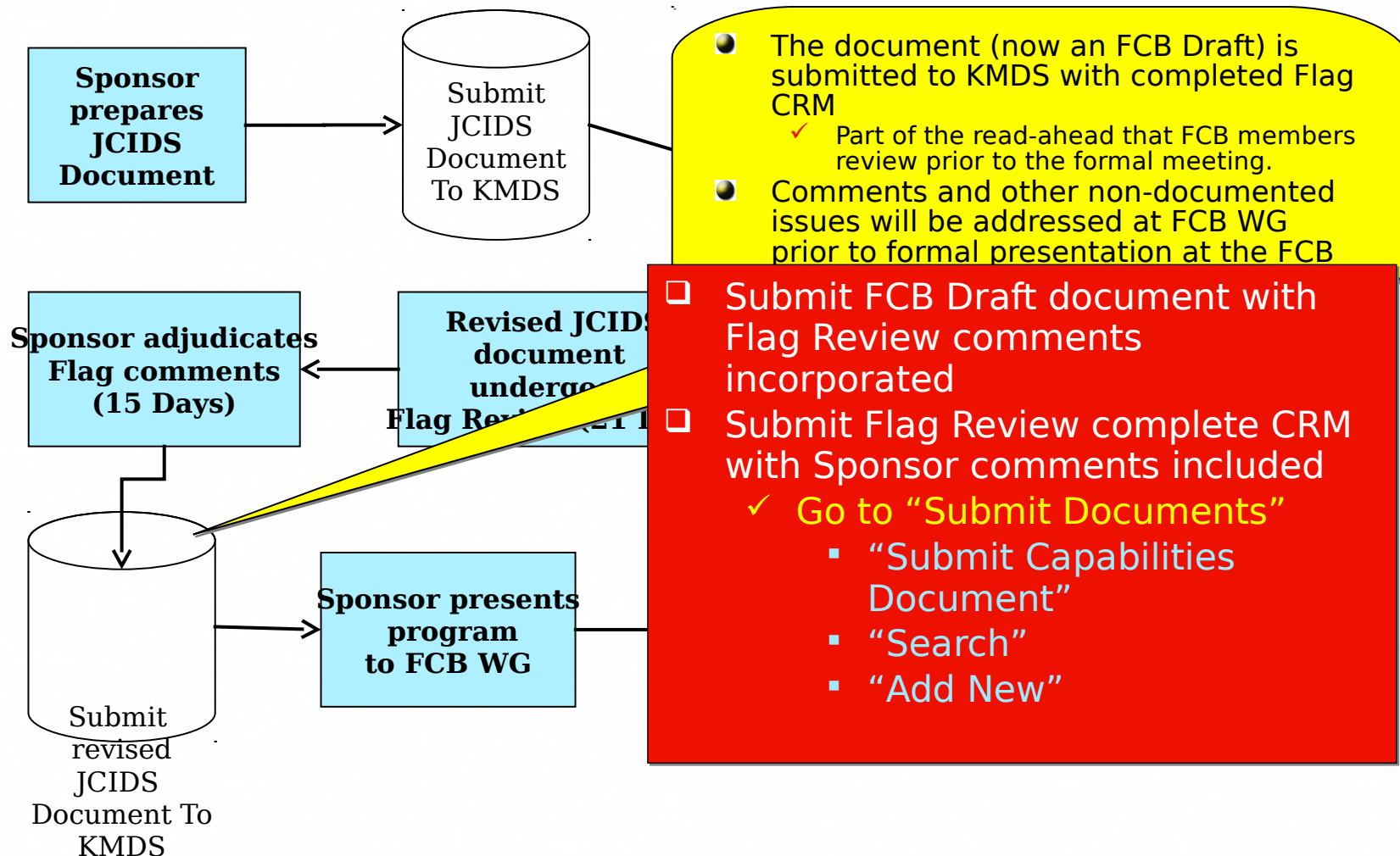


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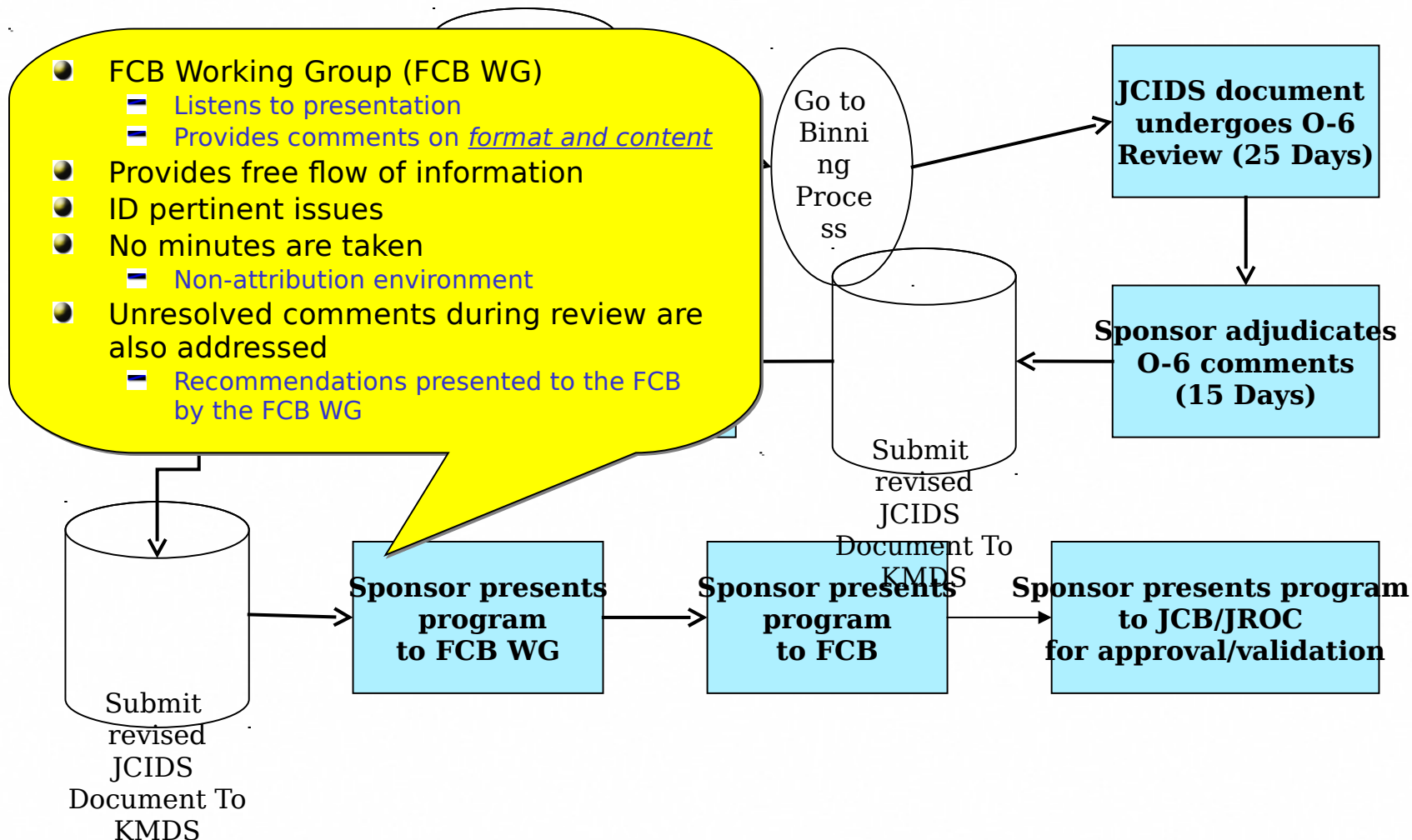


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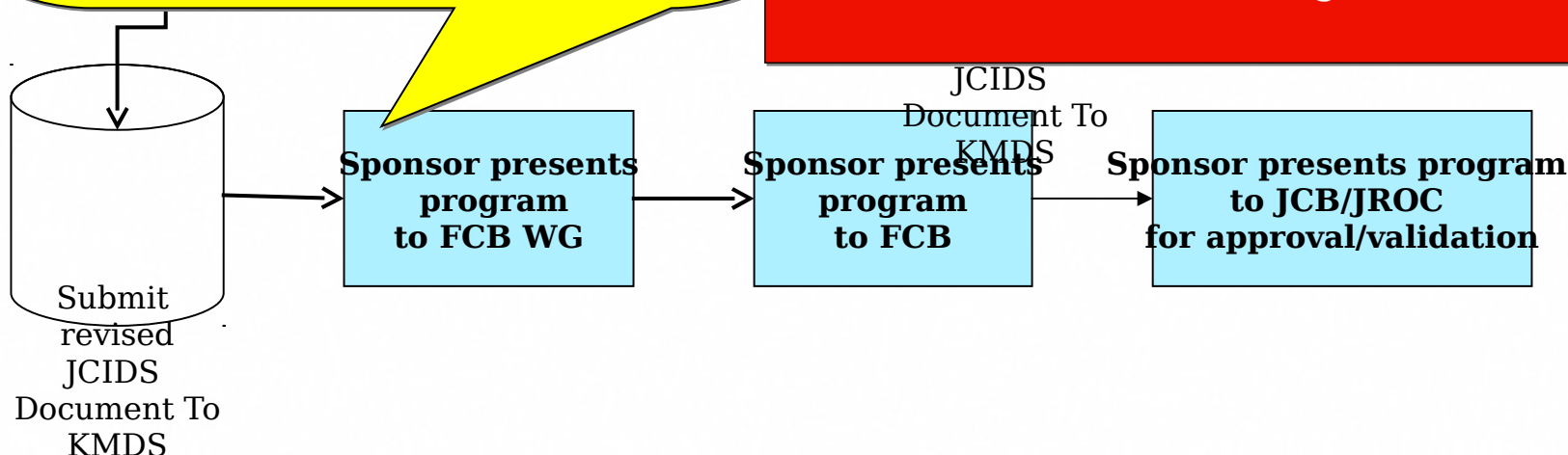




# JCIDS Document Approval

- FCB Working Group (FCB WG)
  - Listens to presentation
  - Provides comments on format and content
- Provides free flow of information
- ID pertinent issues
- No minutes are taken
  - Non-attribution environment
- Unresolved comments during review are also addressed
  - Recommendations presented to the FCB by the FCB WG

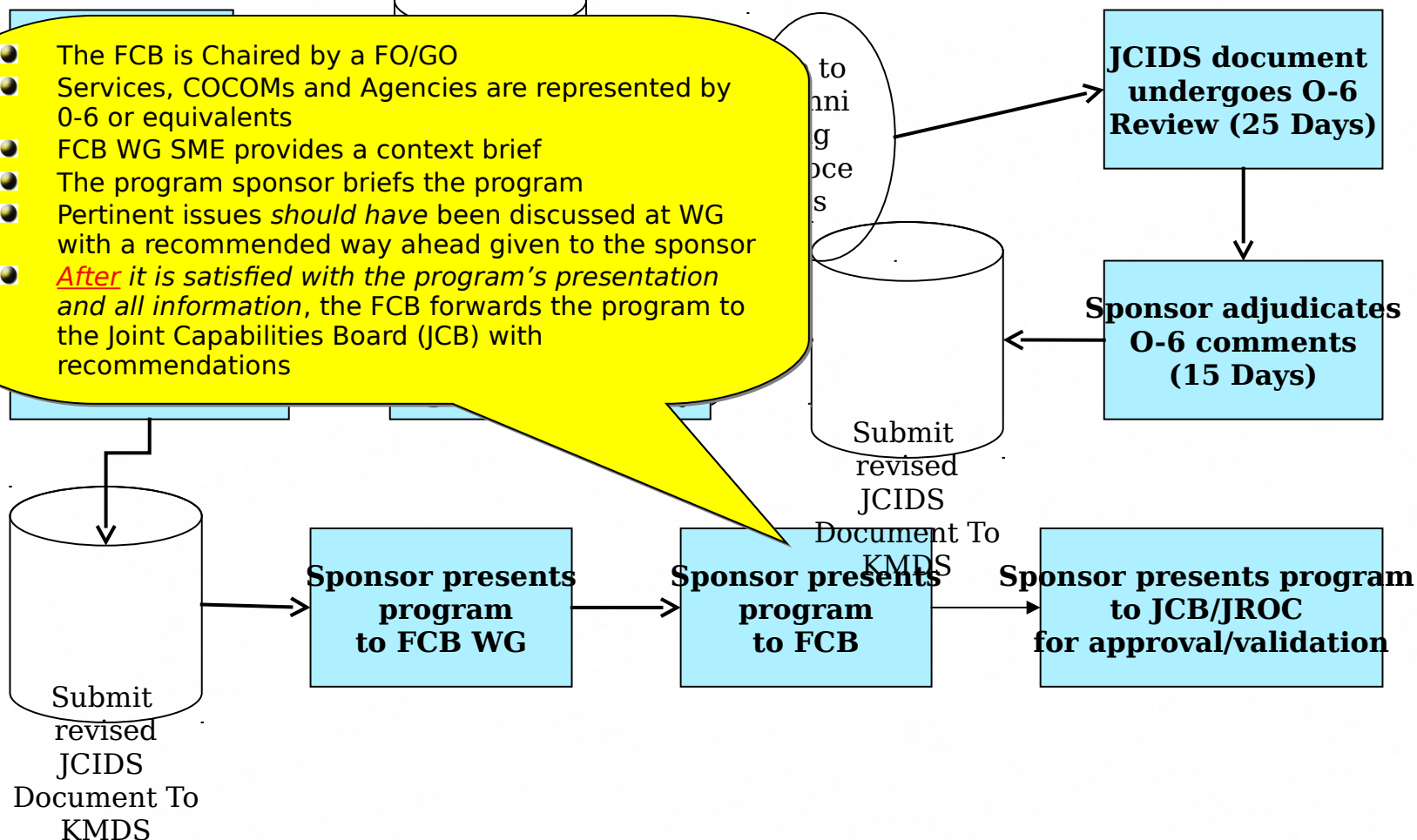
- Provide JROC Program Brief and Context Brief slides (except recommendations slide) NLT 48 hour prior to the Working Group meeting
- Brief FCB WG
- Incorporate comments from Working Group meeting
- Provide updated slides to FCB Secretariat NLT 48 hours prior to scheduled FCB meeting





# JCIDS Document Approval

- The FCB is Chaired by a FO/GO
- Services, COCOMs and Agencies are represented by O-6 or equivalents
- FCB WG SME provides a context brief
- The program sponsor briefs the program
- Pertinent issues *should have* been discussed at WG with a recommended way ahead given to the sponsor
- *After* it is satisfied with the program's presentation and all information, the FCB forwards the program to the Joint Capabilities Board (JCB) with recommendations

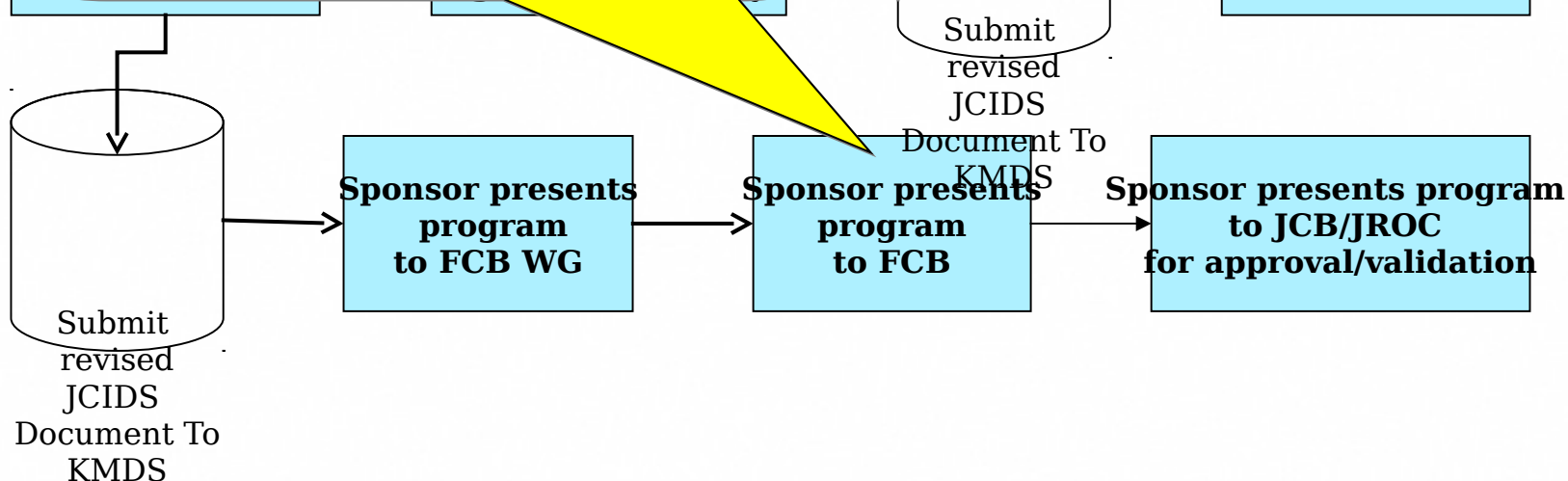




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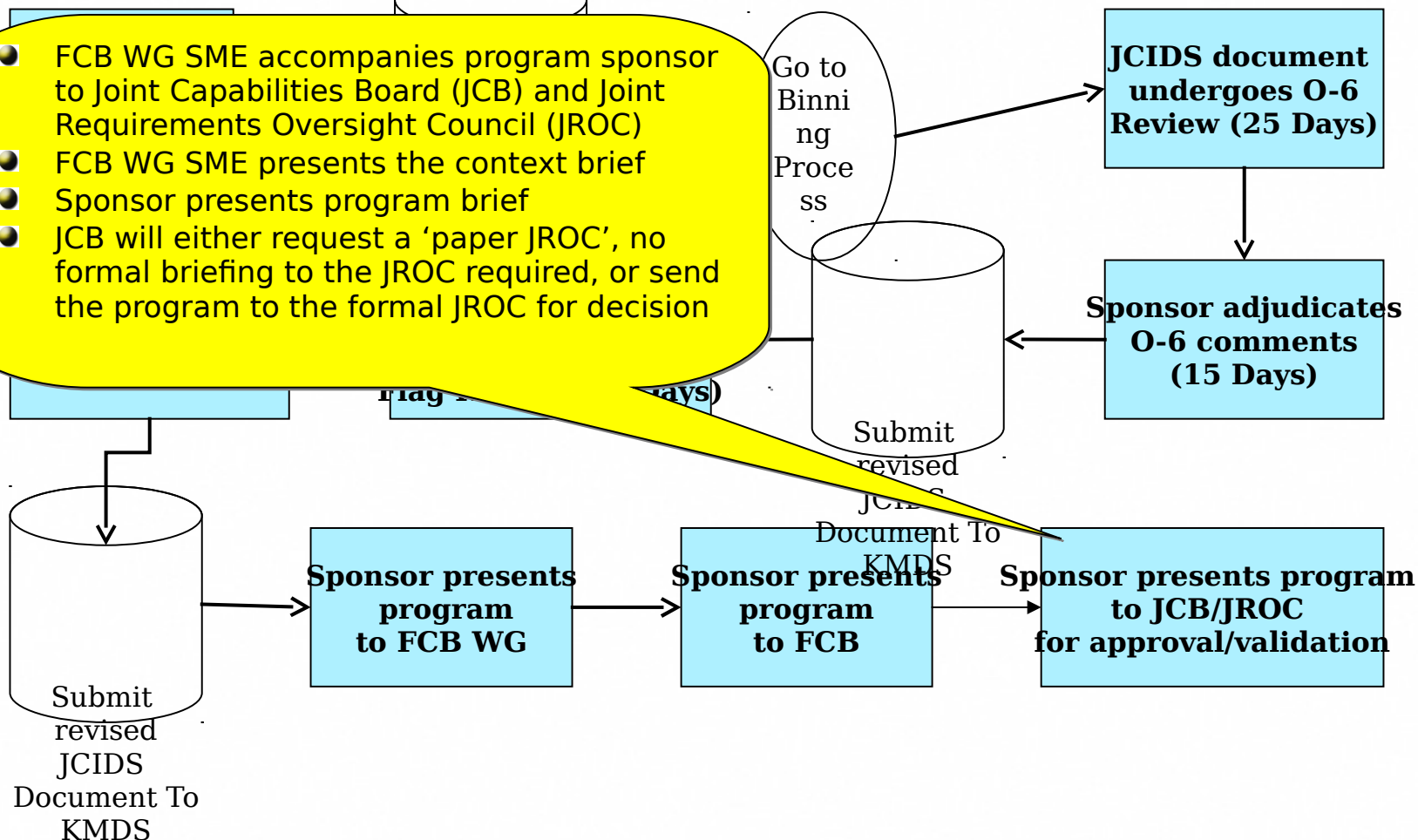
- Joint Staff FCB representative will present Context Brief slides with recommendations from the FCB WG(s) and Supporting FCB, if required
- Brief JROC Program Brief
- Update brief per recommendations of the FCB





# JCIDS Document Approval

- FCB WG SME accompanies program sponsor to Joint Capabilities Board (JCB) and Joint Requirements Oversight Council (JROC)
- FCB WG SME presents the context brief
- Sponsor presents program brief
- JCB will either request a 'paper JROC', no formal briefing to the JROC required, or send the program to the formal JROC for decision

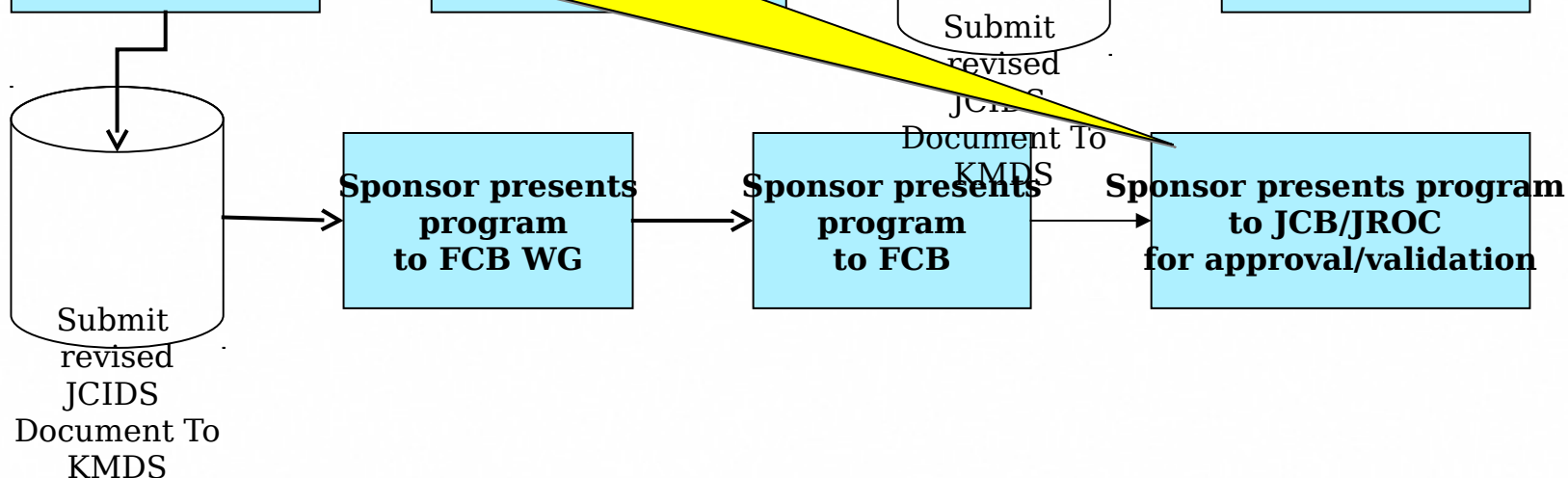




# JCIDS Document Approval

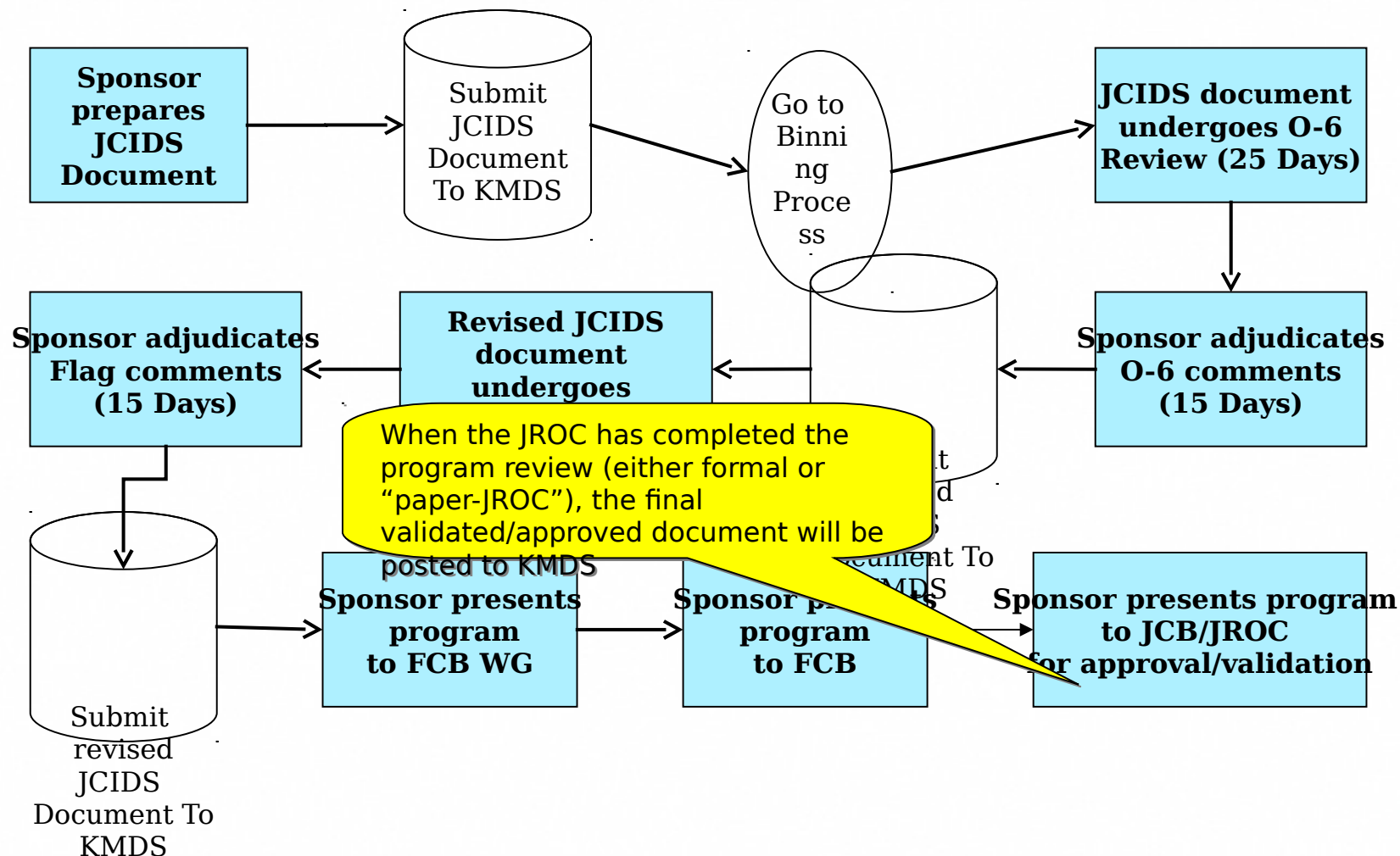
- FCB WG SME accompanies program sponsor to Joint Capabilities Board (JCB) and Joint Requirements Oversight Council (JROC)
- FCB WG SME presents the context brief
- Sponsor presents program brief
- JCB will either request a 'paper JROC', no formal briefing to the JROC required, or send the program to the formal JROC for decision

- Joint Staff FCB representative will present Context Brief slides with recommendations from the C2 FCB and Supporting FCB (if unresolved conflict)
- Brief JROC Program Brief
- Update brief per recommendations of the JCB
- Follow same schedule if required to continue to the JROC





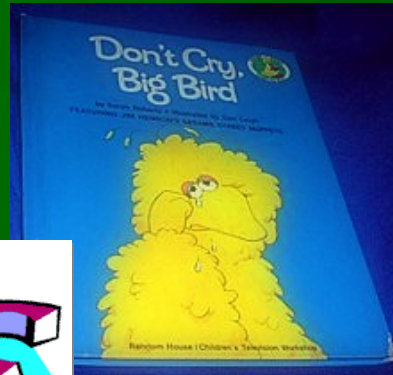
# JCIDS Document Approval





# Capabilities:

## Building Blocks

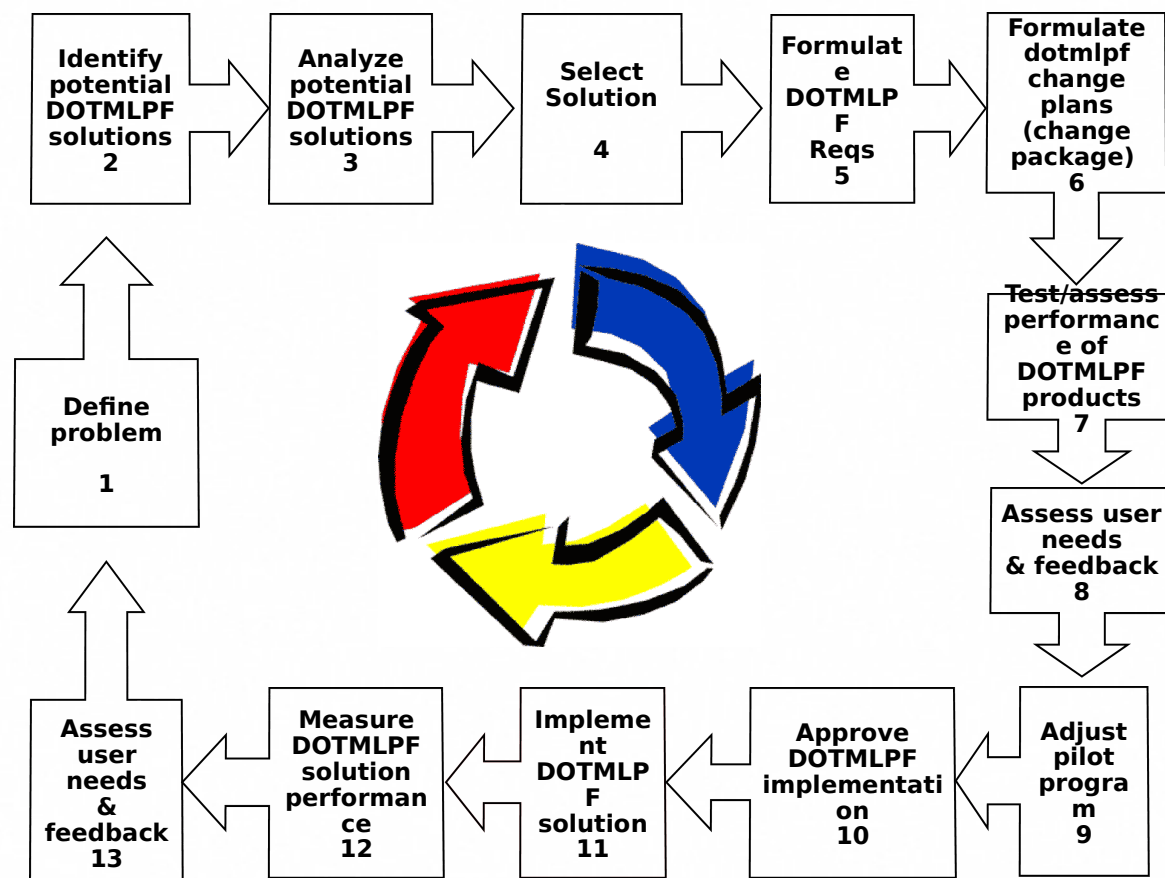


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# Continuous Process Improvement

**“3170/3180 EZ View”**





# Joint Operations Concepts

## JOINT OPERATIONS CONCEPTS

### JROC DRAFT



20 February 2003

In the past, the construct for force development was requirements-driven based upon specific threats. However, the United States cannot predict with confidence the nations, combinations of nations, or non-state actors that may pose threats to its interests, allies or friends. To mitigate the risk of this uncertainty, we must anticipate the range of broad capabilities that any adversary might employ and the necessary capabilities required to resolve any conflict or crisis. Thus, a capabilities-based approach shifts this construct from threat-based force development to force planning based on a **set of desired capabilities for any given military operation.**



# Joint Operations Concepts

JOINT OPERATIONS CONCEPTS

JROC DRAFT



20 February 2003

These desired capabilities are derived from a set of **joint operating concepts**, articulating how the future force will operate within specified segments of the range of military operations, and a set of **functional concepts** that articulate the desired capabilities within each functional area across the **range of military operations**.



# Joint Operations Concepts

JOINT OPERATIONS CONCEPTS

JROC DRAFT



20 February 2003

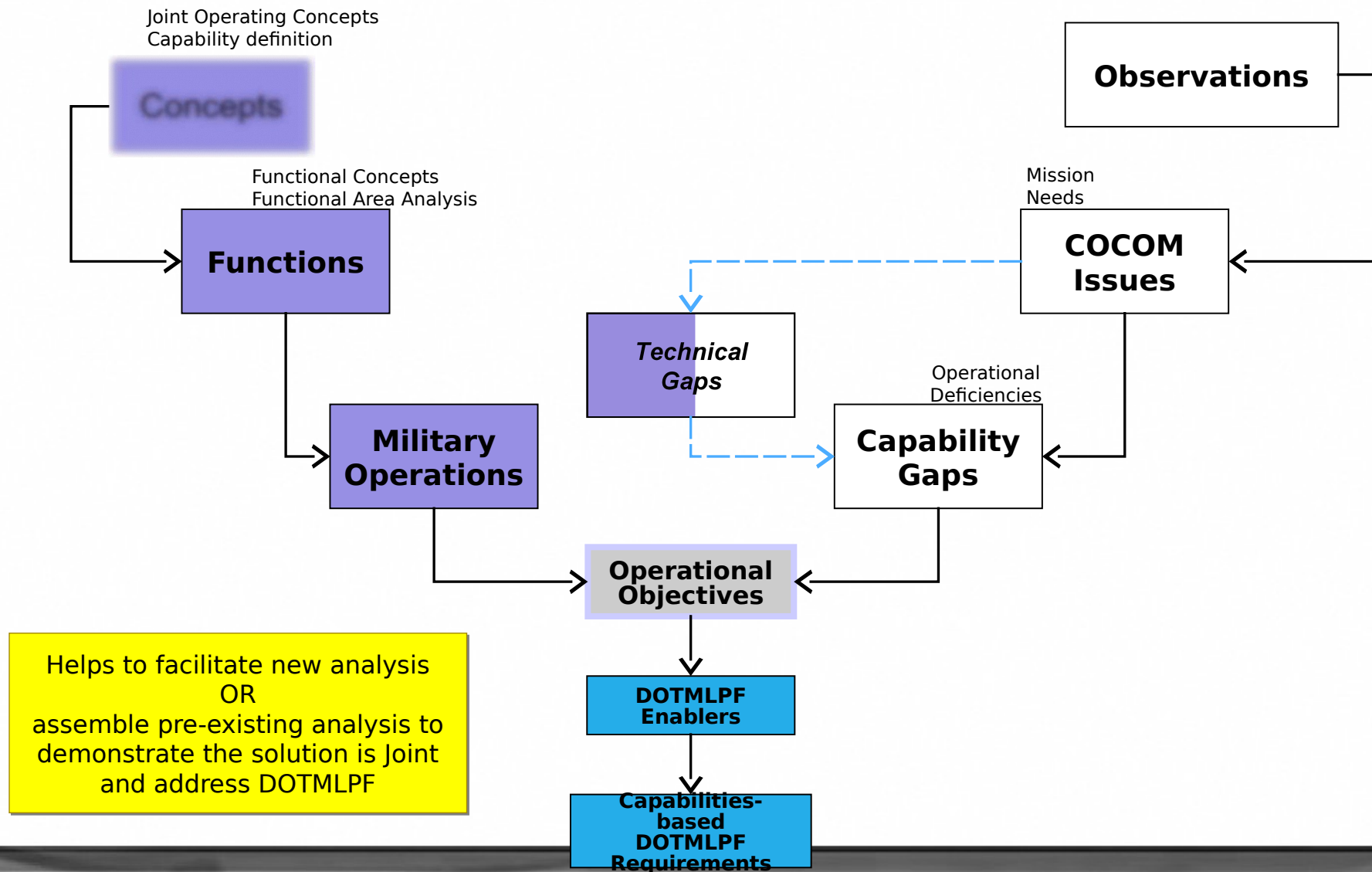
## 5.B. Potential Capabilities-Based DOTMLPF Considerations.

To accomplish transformation DoD **must** implement a process that assesses legacy and proposed systems in the aggregate and defines requires joint capabilities. The process must validate capabilities, considering the **full range of DOTMLPF solutions** to advance joint warfighting and field the capabilities required to deter and defeat our adversaries. The following potential considerations should be examined during initial concept development and assessment: Doctrine, Organization, Training, Materiel, Leadership and Education, Personnel, and Facilities.



# Capabilities Building Blocks

## Understanding the Need

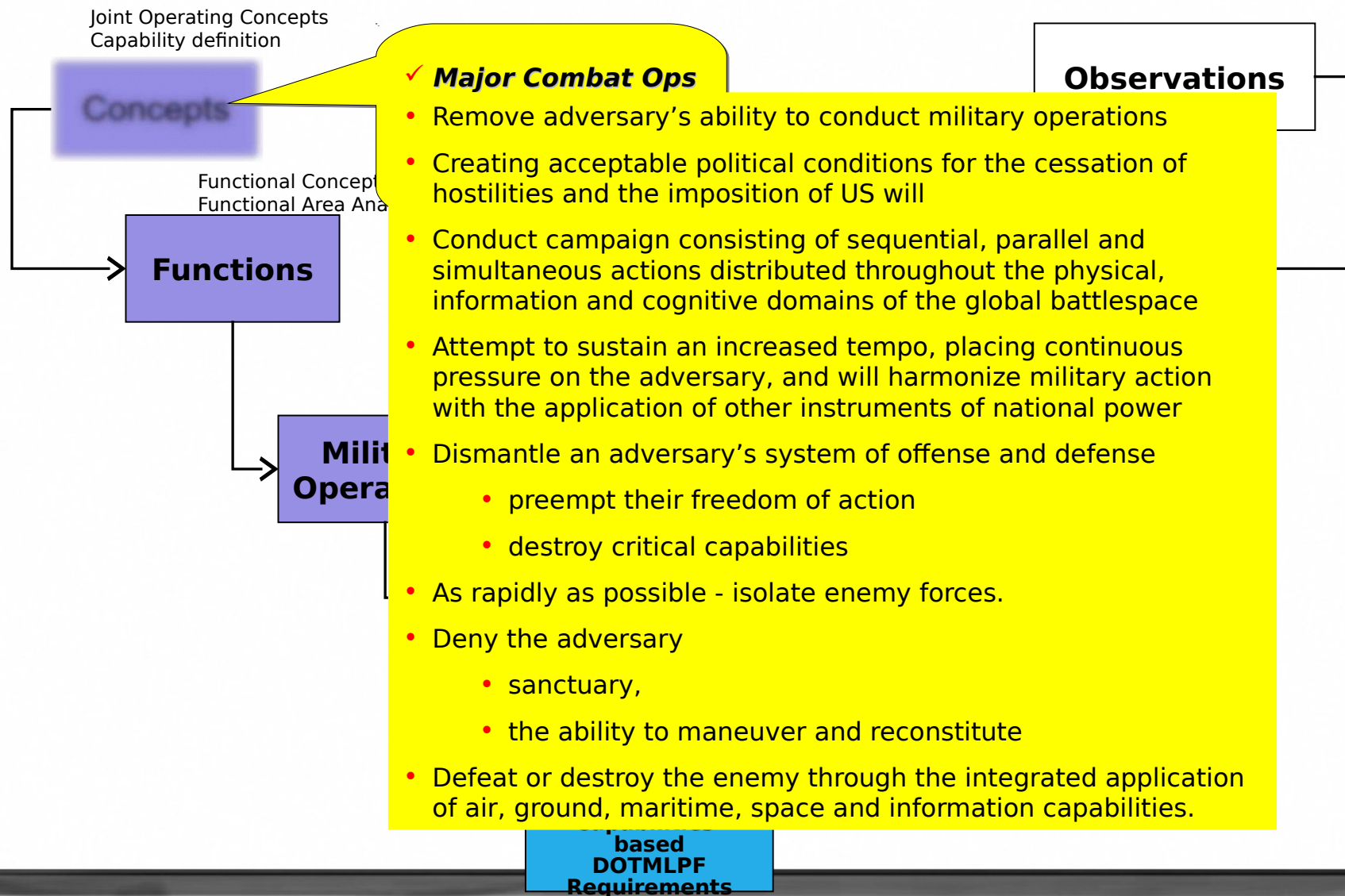






# Capabilities Building Blocks

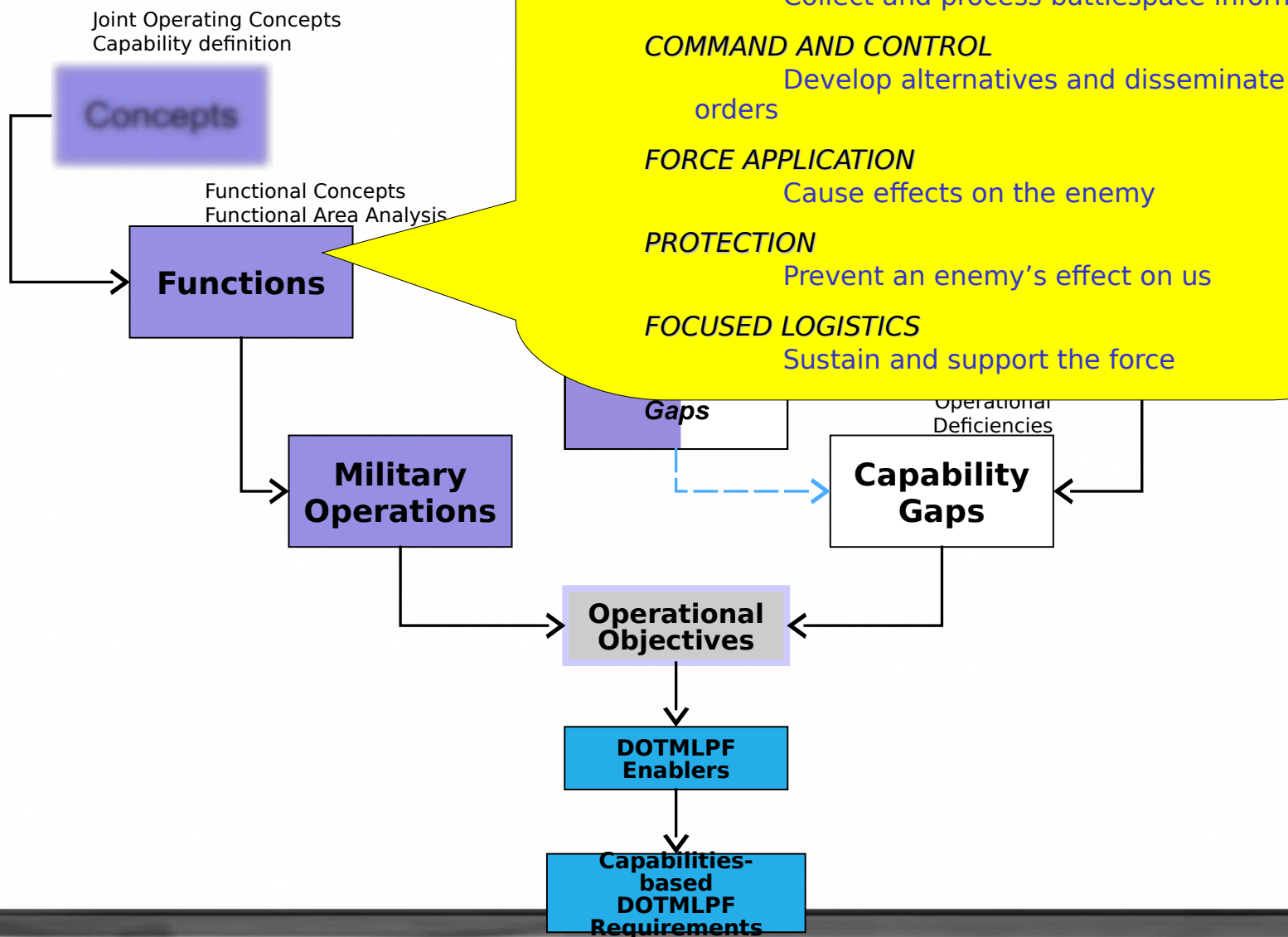
## Understanding the Need





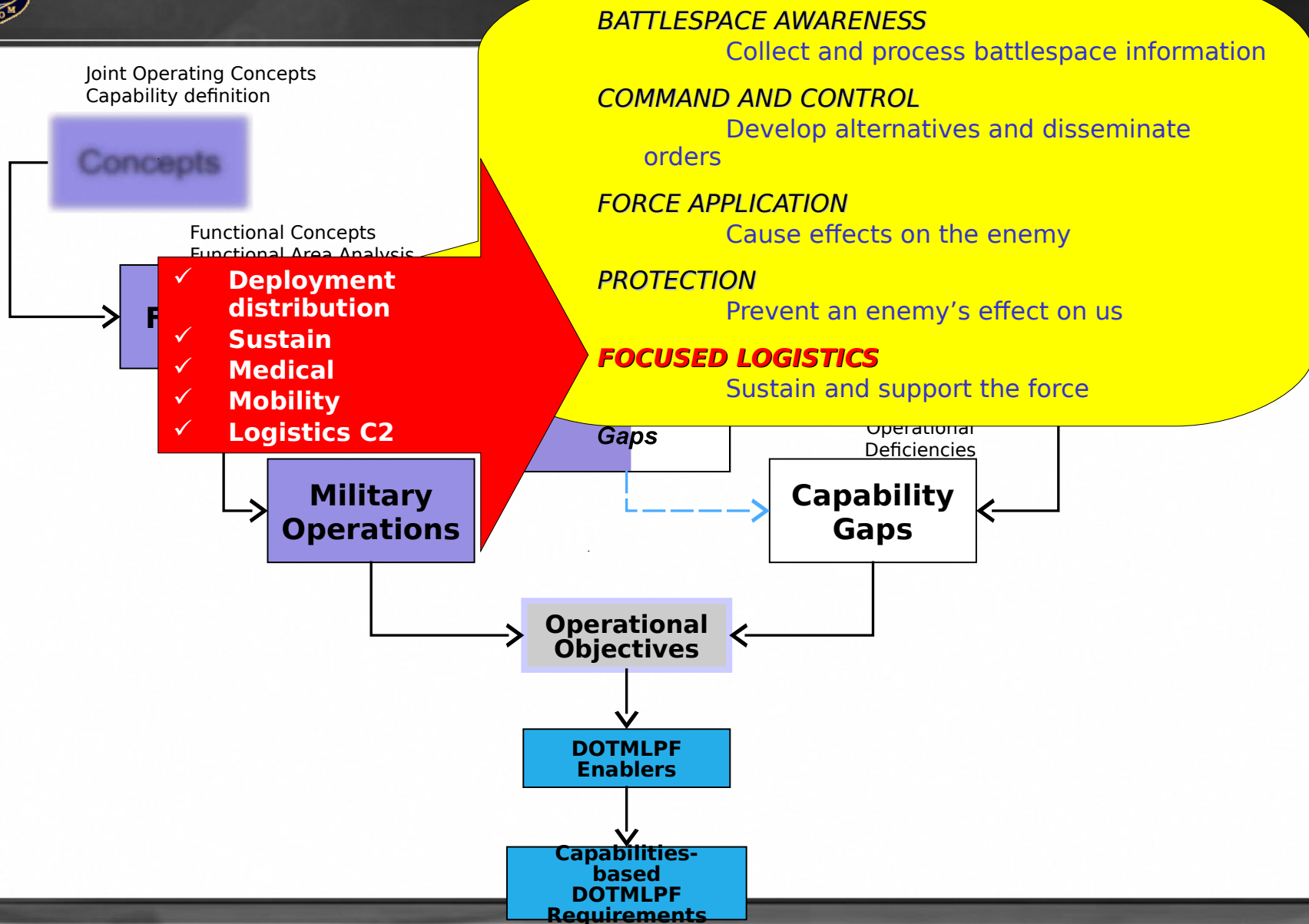
# Capabilities Building Blocks

Under



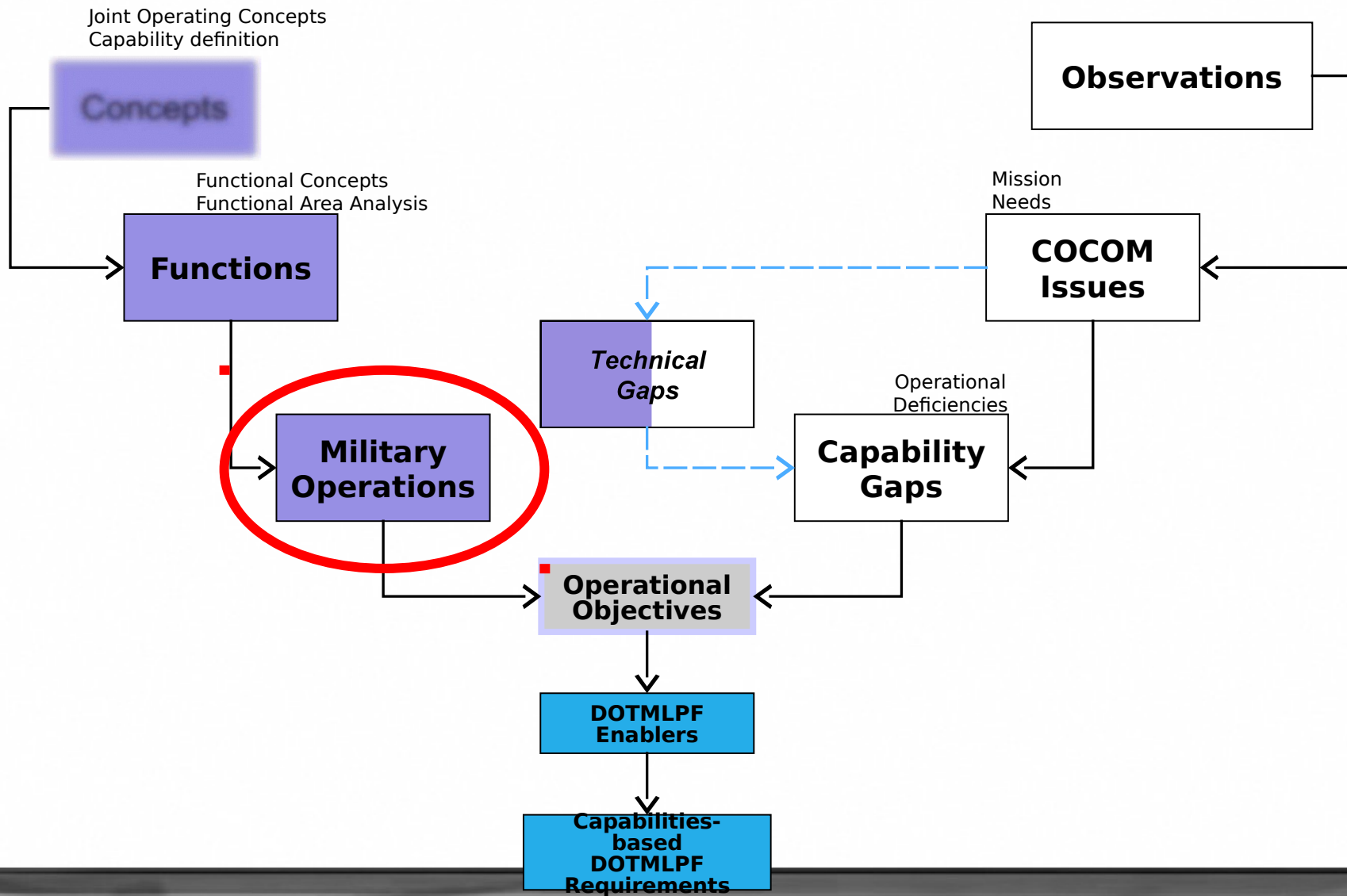


# Capabilities Building Blocks





# Capabilities Building Blocks





# Capabilities Building Blocks

## Functional Area/Ops Mapping

### **Focused Logistics**

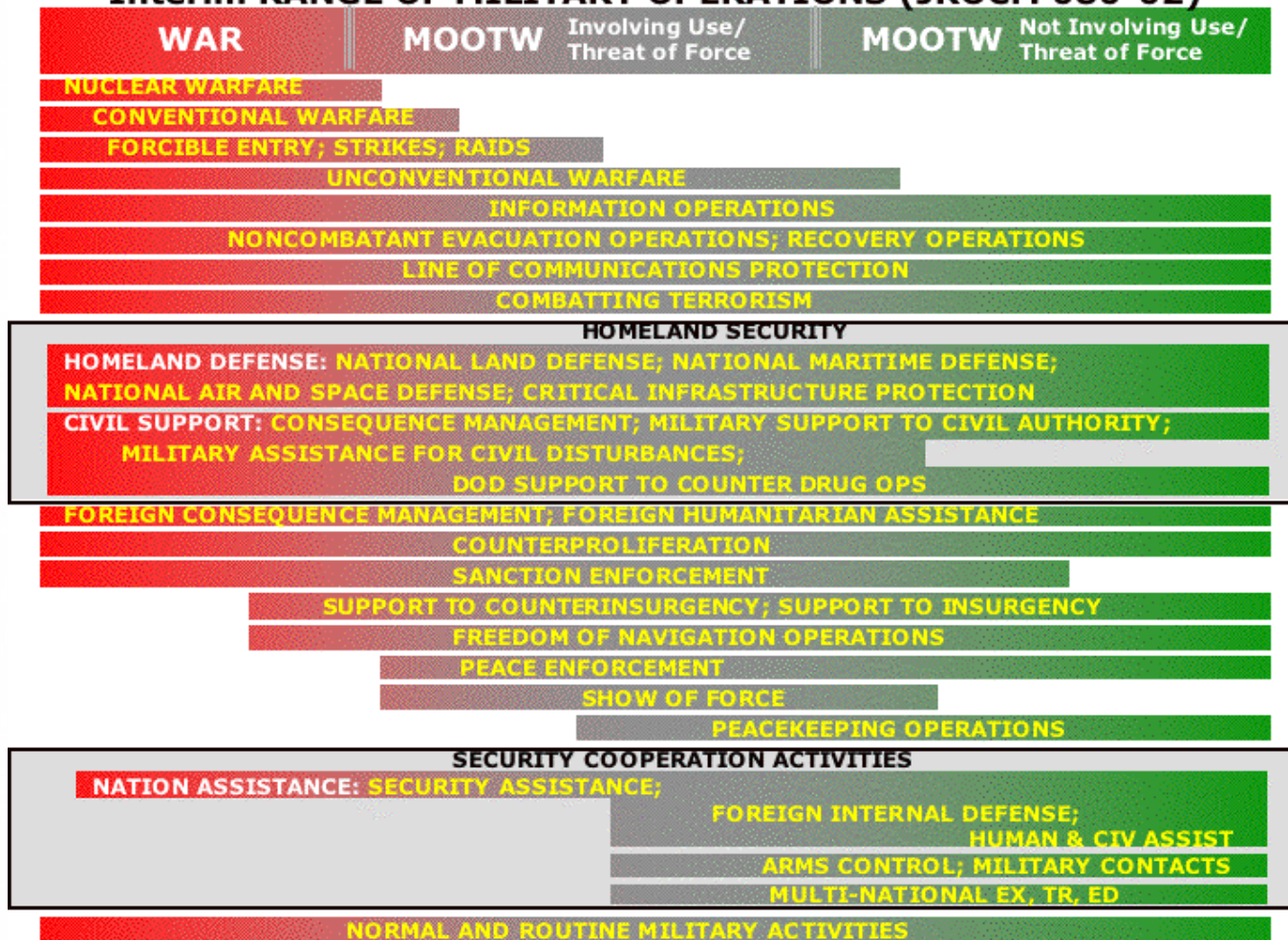
- **JP 1-0** Personnel Support to Joint Ops
- **JP 1-05** Religious Ministry Support for Joint Ops
- **JP 1-06** JTTP for Financial Management During Joint Ops
- **JP 3-0** *Joint Ops*
- **JP 3-02.2** Amphibious Embarkation
- **JP 3-05** Special Ops
- **JP 3-05.1** JTTP for Joint Special Ops Task Force Ops
- **JP 3-06** Urban Ops
- **JP 3-07** Military Ops Other Than War
- **JP 3-07.5** JTTP for Noncombatant Evacuation Ops
- **JP 3-07.6** JTTP for Foreign Humanitarian Assistance
- **JP 3-10** Rear Area Ops
- **JP 3-11** Ops in Nuclear Biological and Chemical (NBC) Environments
- **JP 3-13** Information Ops
- **JP 3-16** Multinational Ops
- **JP 3-17** JD&TTP for Air Mobility Ops
- **JP 3-33** Joint Force Capabilities
- **JP 3-35** Joint Deployment and Redeployment Ops
- **JP 3-51** Electronic Warfare
- **JP 3-54** Ops Security
- **JP 3-57** Civil-Military Ops
- **JP 3-57.1** Civil Affairs
- **JP 3-61** Public Affairs in Joint Ops
- **JP 4-0** *Logistic Support of Joint Ops*
- **JP 4-01** Defense Transportation System
- **JP 4-01.2** JTTP for Sealift Support to Joint Ops
- **JP 4-01.3** JTTP for Movement Control
- **JP 4-01.4** JTTP for Joint Theater Distribution
- **JP 4-01.5** JTTP for Transportation Terminal Ops
- **JP 4-01.6** JTTP for Joint Logistics Over the Shore
- **JP 4-01.7**, JTTP for Use of Intermodal Containers in Joint Ops
- **JP 4-01.8** JTTP for Joint RSOI
- **JP 4-02** Doctrine for Health Service Support in Joint Ops
- **JP 4-02.1** JTTP for Health Service Logistic Support in Joint Ops
- **JP 4-02.2** JTTP for Patient Movement in Joint Ops
- **JP 4-03** Joint Bulk Petroleum and Water Doctrine
- **JP 4-04** Civil Engineering Support
- **JP 4-05** Mobilization Planning
- **JP 4-05.1** JTTP for Manpower Mobilization and Demobilization Ops: Reserve Component (RC) Callup
- **JP 4-06** JTTP for Mortuary Affairs in Joint Ops
- **JP 4-07** JTTP for Common-User Logistics During Joint Ops
- **JP 4-08** Logistic Support of Multinational Ops
- **JP 5-0** Doctrine for Planning Joint Operations
- **JP 6-0** C4 Systems Support to Joint Operations
- **JP 6-02** Employment of Operational/Tactical C4 Systems



# ROMOs

- ✓ Know what they are
- ✓ Understand how the Joint Doctrine pubs map and relate to them
- ✓ DON'T use them in the task decomposition process
- ✓ DO use supporting analysis to explain how your solution strengthen capabilities which support ROMOs

## Interim RANGE OF MILITARY OPERATIONS (JROCM 080-02)



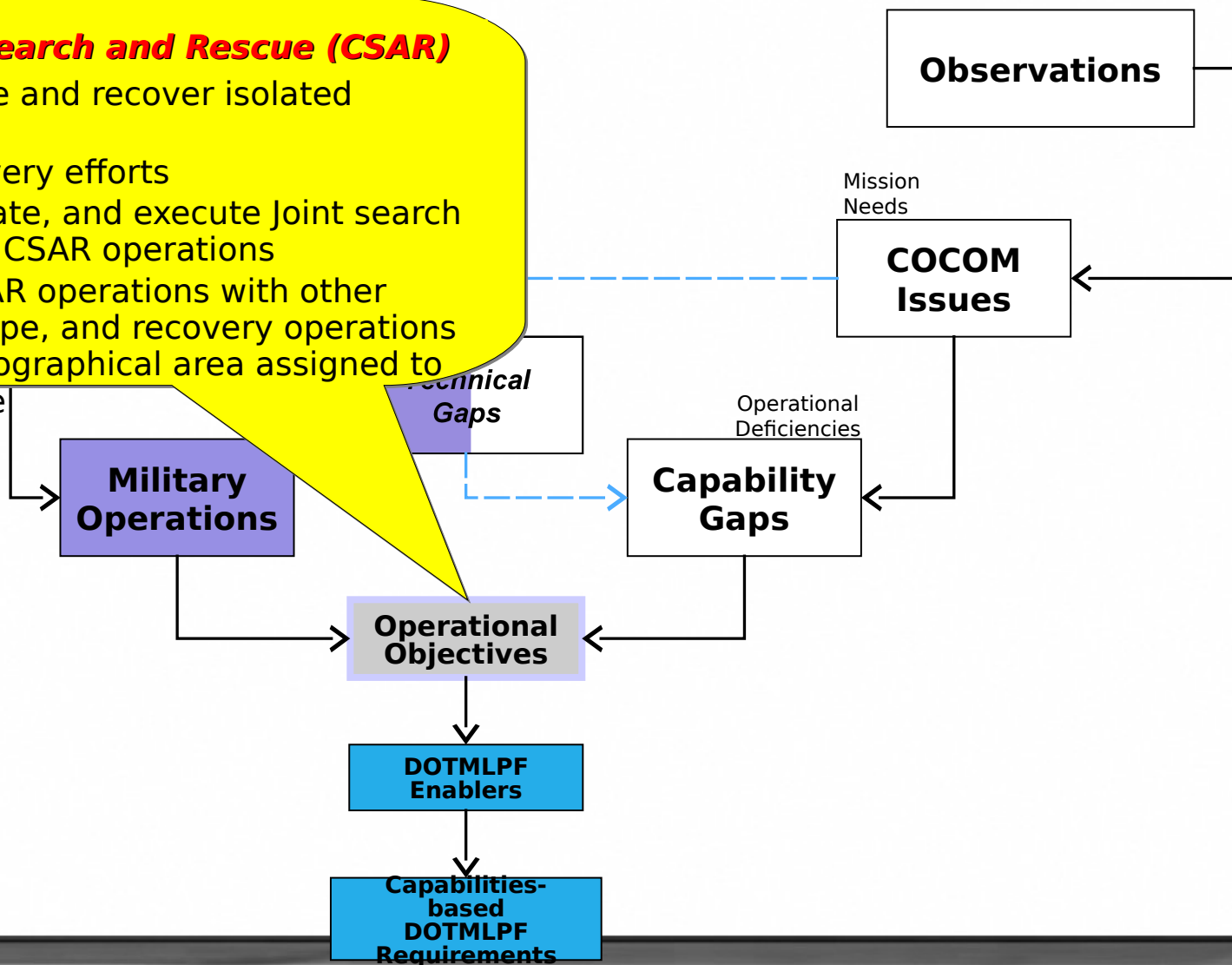


# Capabilities Building Blocks

## Operational Objective Examples

### **Combat Search and Rescue (CSAR)**

- Search, locate and recover isolated personnel
- Monitor recovery efforts
- Plan, coordinate, and execute Joint search & rescue and CSAR operations
- Integrate CSAR operations with other evasion, escape, and recovery operations within the geographical area assigned to the Joint force





# Capabilities Building Blocks

## DOTMLPF Enablers Examples

**Doctrine:** new or revised

- ✓ Joint Doctrine Publications
- ✓ Service Doctrine Publications
- ✓ Tactics, Techniques, and Procedures
- ✓ Policy

**Functions**

**Military Operations**

*Technical Gaps*

**Operational Objectives**

**DOTMLPF Enablers**

**Capabilities-based DOTMLPF Requirements**

**Observations**

Mission Needs

**COCOM Issues**

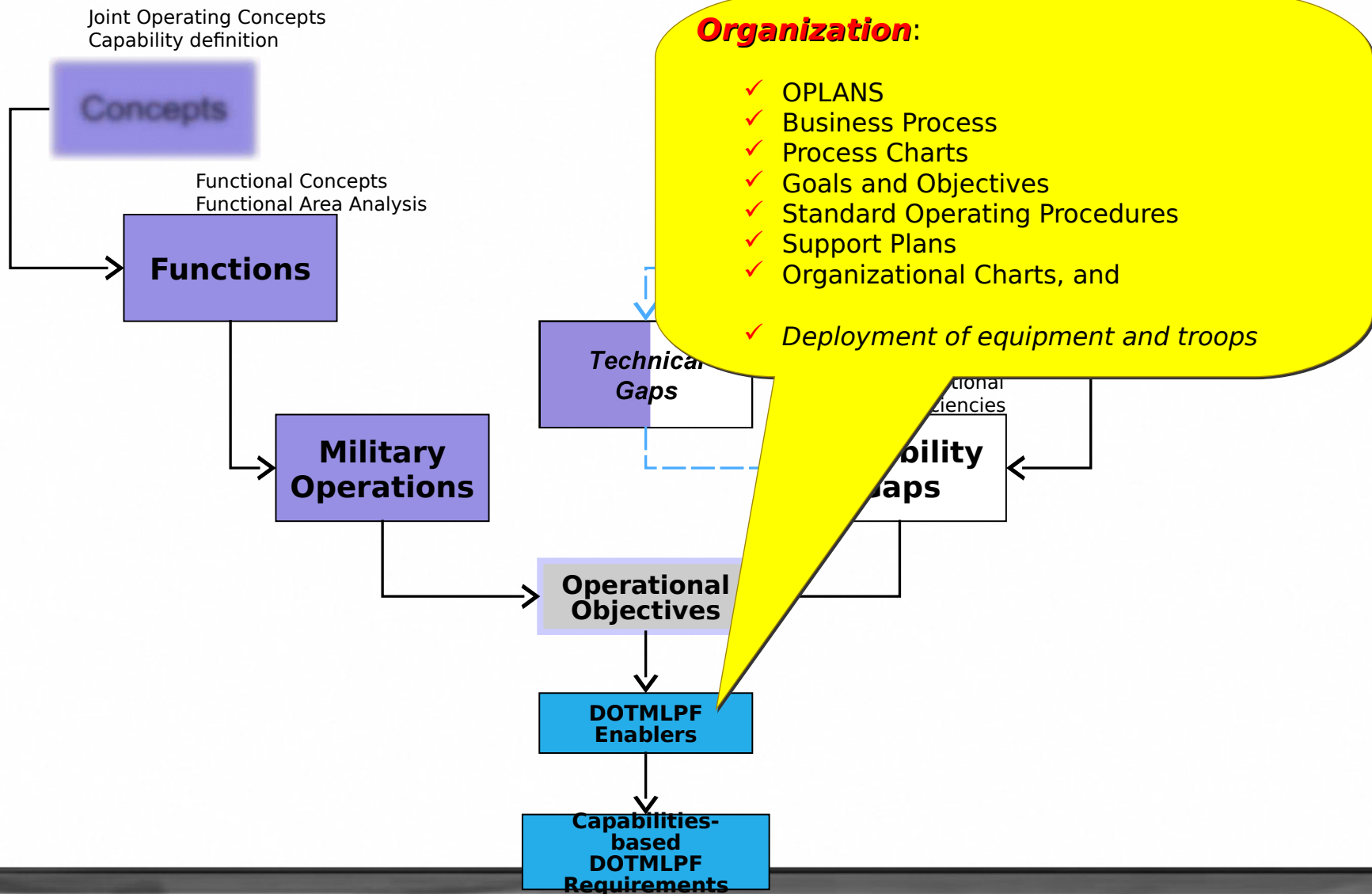
Operational Deficiencies

**Capability Gaps**



# Capabilities Building Blocks

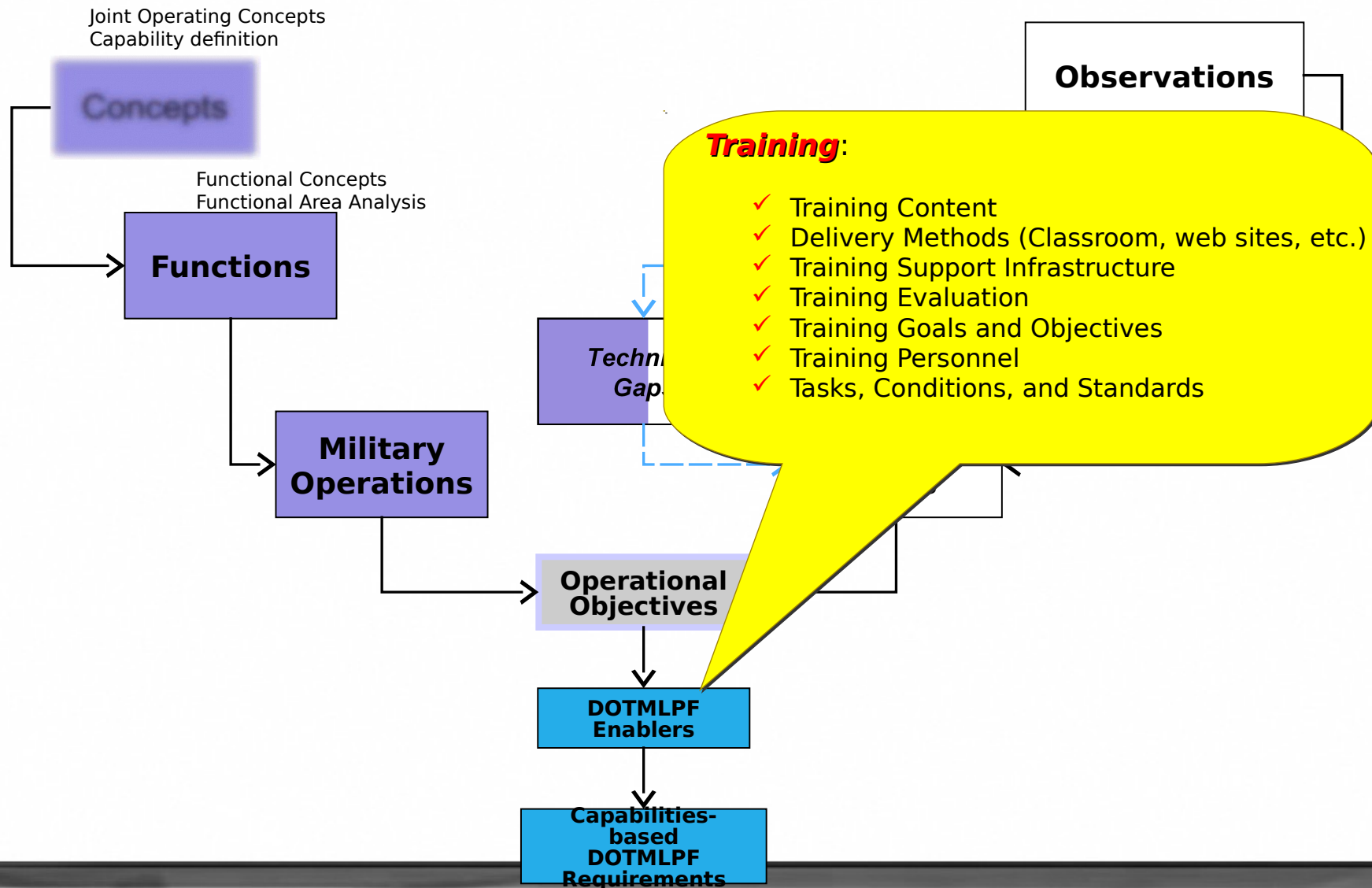
## DOTMLPF Enablers Examples





# Capabilities Building Blocks

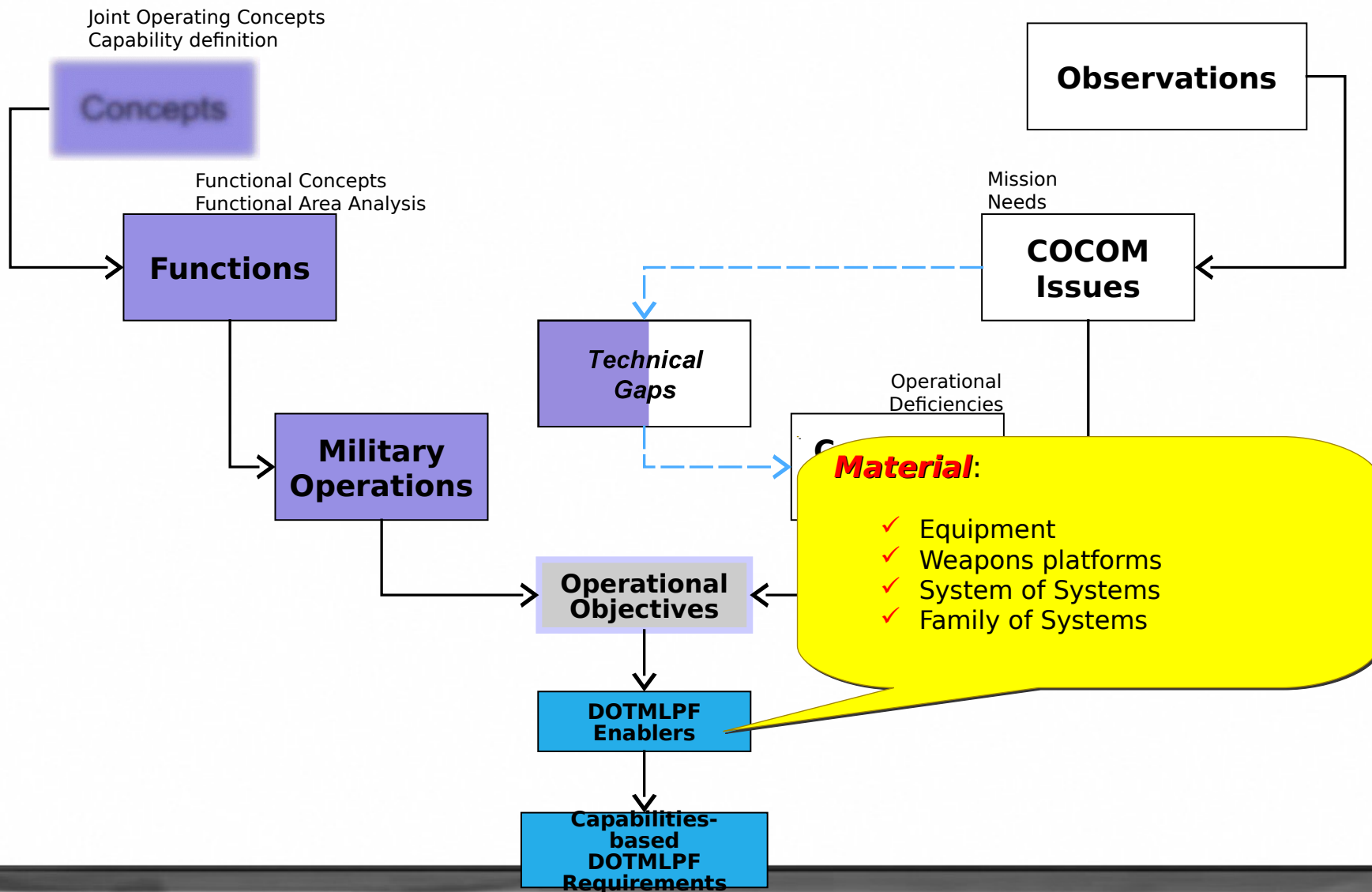
## DOTMLPF Enablers Examples





# Capabilities Building Blocks

## DOTMLPF Enablers Examples





# Capabilities Building Blocks

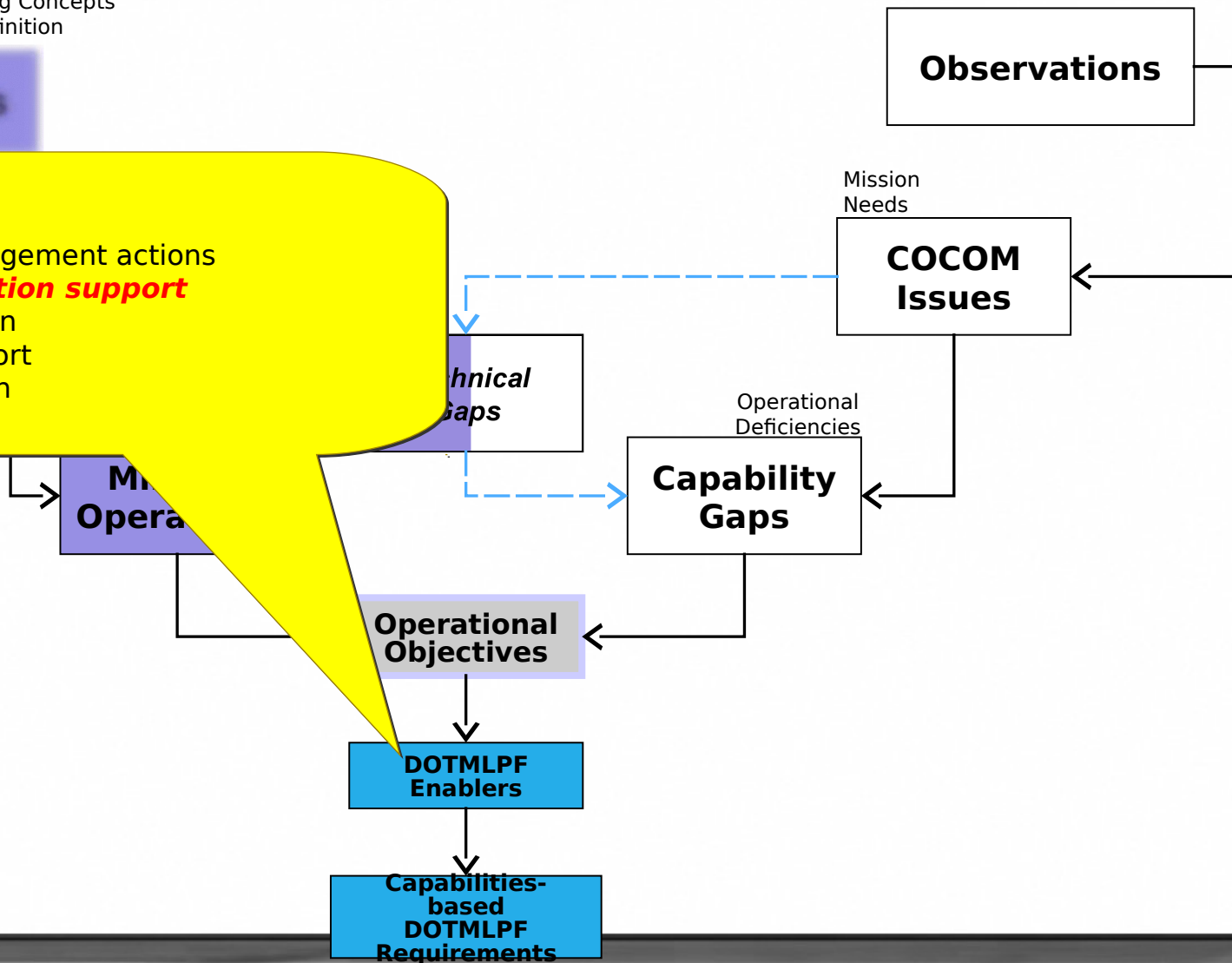
## DOTMLPF Enablers Examples

Joint Operating Concepts  
Capability definition

Concepts

### **Leadership:**

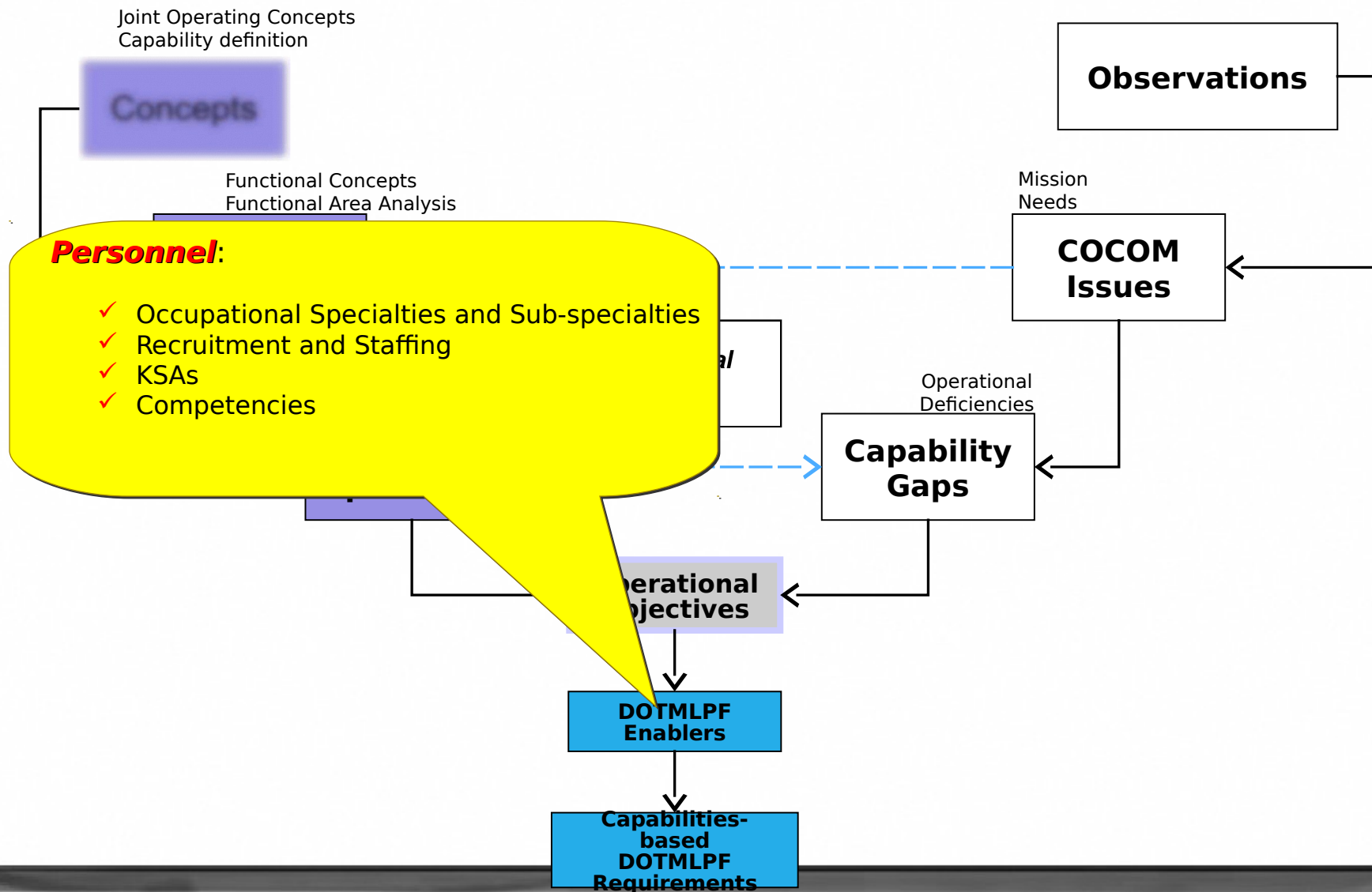
- ✓ Change management actions
- ✓ **Implementation support**
- ✓ Policy direction
- ✓ Funding support
- ✓ Plans of Action





# Capabilities Building Blocks

## DOTMLPF Enablers Examples







# Issue Development

## The Key to *Everything*



*"Let's start at the very beginning..."*



# Why Spend Time on the Issues?

- To properly identify and describe what constitutes “improved mission performance”
- Not just recognize pain, but understand the causes
  - Multiple choice vs. essay
- Efficiently identify a set of detailed capabilities and capabilities-based requirements
  - CBRs naturally flow from well defined issues
  - Good issue sets:
    - Make identification of architectures easier
    - Make writing an operational concept for your program easier, and
    - Help answer questions from approval authorities
    - Help justifying solutions to approval authorities



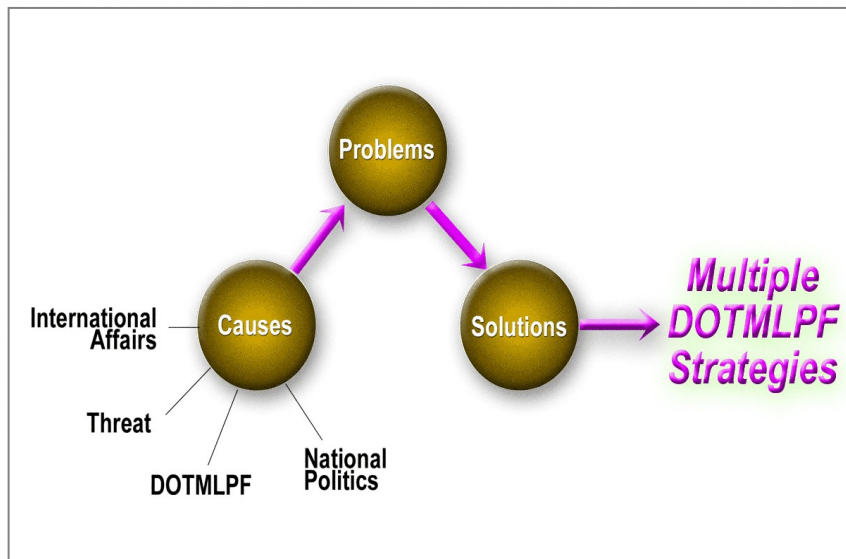
# Issue Validity

- Validity is **the primary consideration** when identifying and crafting issue statements that will be used as a basis to develop and implement of DOTMLPF solutions.
- Other
  - Timeliness
  - Urgency
- Unless the issue statement is valid (and true), any solution developed to address it will be inadequate to solve any real warfighting problems.



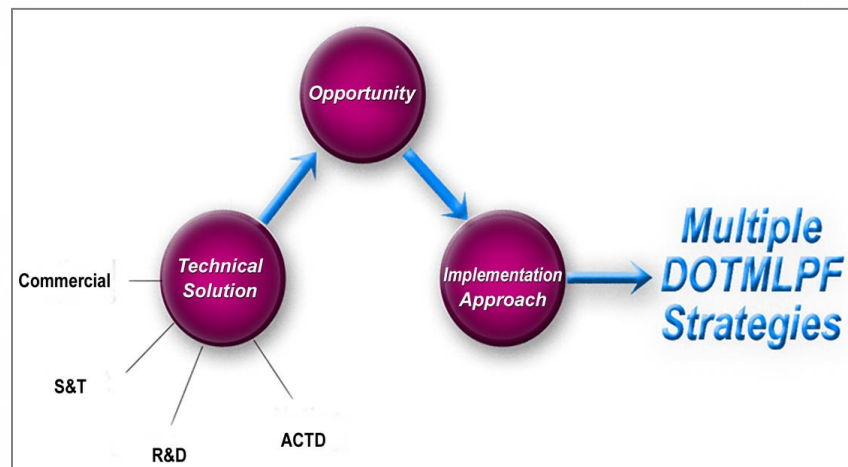
# Material vs. Non-material

## Bad Puppy



## Defining the Problem

## Implementing the Solution





# Observations vs. Issues

## ● **Observations**

- “I saw a problem. I observed it first-hand, read about it in an After Action Report, heard about it at a meeting, or saw it on the news. I know something, but I don’t understand the causes and haven’t done any research or investigation to understand neither cause nor effect. I have made some assumptions based on experience and context.”

## ● **Issue statements**

- “I saw a problem. I observed it first-hand, read about it in an After Action Report, heard about it at a meeting, or saw it on the news. I know something, and have done research or investigation to understand cause and effect. I started with some assumptions based on experience and context, but investigation has led me to a fuller understanding of the scope (both breadth and depth) of the problem. I have developed a set of valid statements which must be addressed in order to develop a solution to the problem.”



# Useful Definitions

## ● **Problem:**

- An undesirable state that exists which results in either technical or operational deficiencies (capability gaps) reducing warfighter readiness or performance.

## ● **Observation:**

- An event or condition that has actually been seen, witnessed, or where evidence of an event or condition is actually seen or witnessed.

## ● **Assumption:**

- A statement or condition believed to be true based on context or prior knowledge and/or experience in the absence of factual data or analysis.

## ● **Conclusion:**

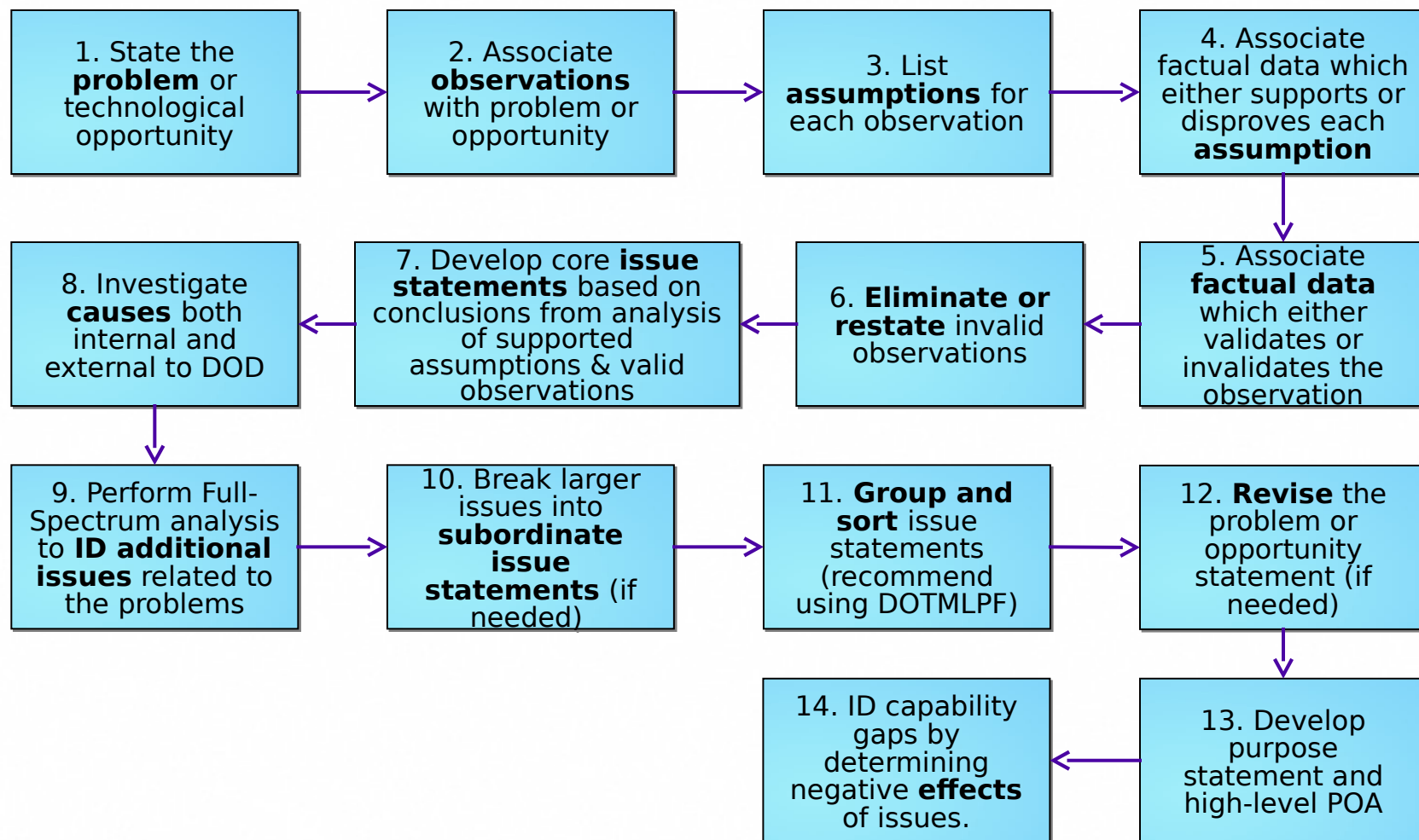
- A statement believed to be true resulting from analysis based on assumptions and/or factual data.

## ● **Issue Statement:**

- A valid, true statement whose truth is based on acceptable degree or investigation, research, and analysis.



# Turning Observations into Meaningful Issues





# Crafting the Issue Statement

- You have to format the input to get the desired output
  - Input = well constructed issue statements
  - Output = operational IERs, complete Ops Concept, Operational Architecture, etc.
- Issue statement has two parts
  - Basic statement of shortcoming, deficiency, or opportunity
  - WRI (which results in) phrase(s)
    - The WRIs will help you derive all the requirements or capabilities for the new system.
    - The WRIs need to be specific.
- Essential that as many WRIs as possible be identified to ensure derivation of all valid requirements





# Full Spectrum Analysis

We suggest using several different analytical methods for identifying issues needed to generate both production (BIG DOTMLPF) and implementation (little dotmlpf) requirements. Each method places the analyst at a different vantage point, resulting in a slightly different set of requirements. Any method used alone will result in an incomplete set of issues and requirements, and therefore lead to an inadequate solution. Used in combination, they will yield a full spectrum of solid, testable requirements.

## 5 Analytical Layers for Identifying Issues

1. Qualities and Characteristics Mode
2. Functions Mode
3. What, Who, Where, When & How Mode
4. Products and Services Mode
5. Combination Mode





# Full Spectrum Analysis

## Qualities & Characteristics Mode



Operability  
Usability (Human Operability)  
Interoperability  
Reliability  
Maintainability  
Serviceability  
Transportability  
Mobility  
Testability  
Producability  
Disposability



# Full Spectrum Analysis

## Functions Mode

- Intelligence: Human, Signal, Communications, etc.
- Personnel: MW&R, Postal Ops, Awards and Decs, Rotation Planning, Manpower, Enemy POW and/or Detainee Ops, etc.
- Deployment: Pre-Deployment, Movement to and Activity at POE, Movement to POD, **JRSOI**

### Reception

Prepare to receive the force  
Conduct POD operations

### Staging

Assemble & marshal  
the forces

### Onward Movement

Prepare the force  
Onward Movement

### Integration

Complete force integration  
Conduct tactical assembly area operations



# Full Spectrum Analysis

## W<sup>4</sup>H Mode

### What

Threat  
Capability gaps  
Present  
Projected future  
Technology application

Specific core deficiencies, problem areas, or opportunities stated as single issues

### Who

#### Doctrine

Strategy  
Policy  
Goals & Objectives  
Plans & Procedures

#### Organization

Ownership of Assets  
Decision Authority  
Command relationships

#### Material

Comm. interfaces

#### Training

Competencies  
Knowledge  
Skills  
Abilities  
New schools  
Process

#### Personnel, Facilities

Support Needs

Organization setting. Which organizations interface with the system? Address interfaces with other Joint Systems. Who will use the system when it is developed and fielded?

### Where

#### Programmatic

Milestones  
Time frames  
Deadlines  
Deliverable dates  
FOS Synchronization  
P<sup>3</sup>I  
Time phasing  
Spiral acquisition  
Spiral development

#### Operational

Phases of campaign  
IOC  
Deployment process

Time frames that will support acquisition approach. Milestones and/or dates to be delivered and fielded. Also consider phases of campaign

### When

#### Place on the battlefield

Mobility  
Accessibility  
Survivability

#### Physical Environment

Facilities  
Terrain  
Weather & climate

#### Theater specific considerations

Supplies  
Transportation  
Deployment  
Installation  
Network  
Maintenance  
Civil considerations

The system's place on the future battlefield. Consider physical environment.

### How

#### Doctrine

TTP  
OPLANS  
Military conditions  
ROE

#### Leadership

Decision Support  
Information Mgmt  
Deployment

#### Material

Network  
Design  
Implementation  
FOS Integration  
Performance

#### Personnel

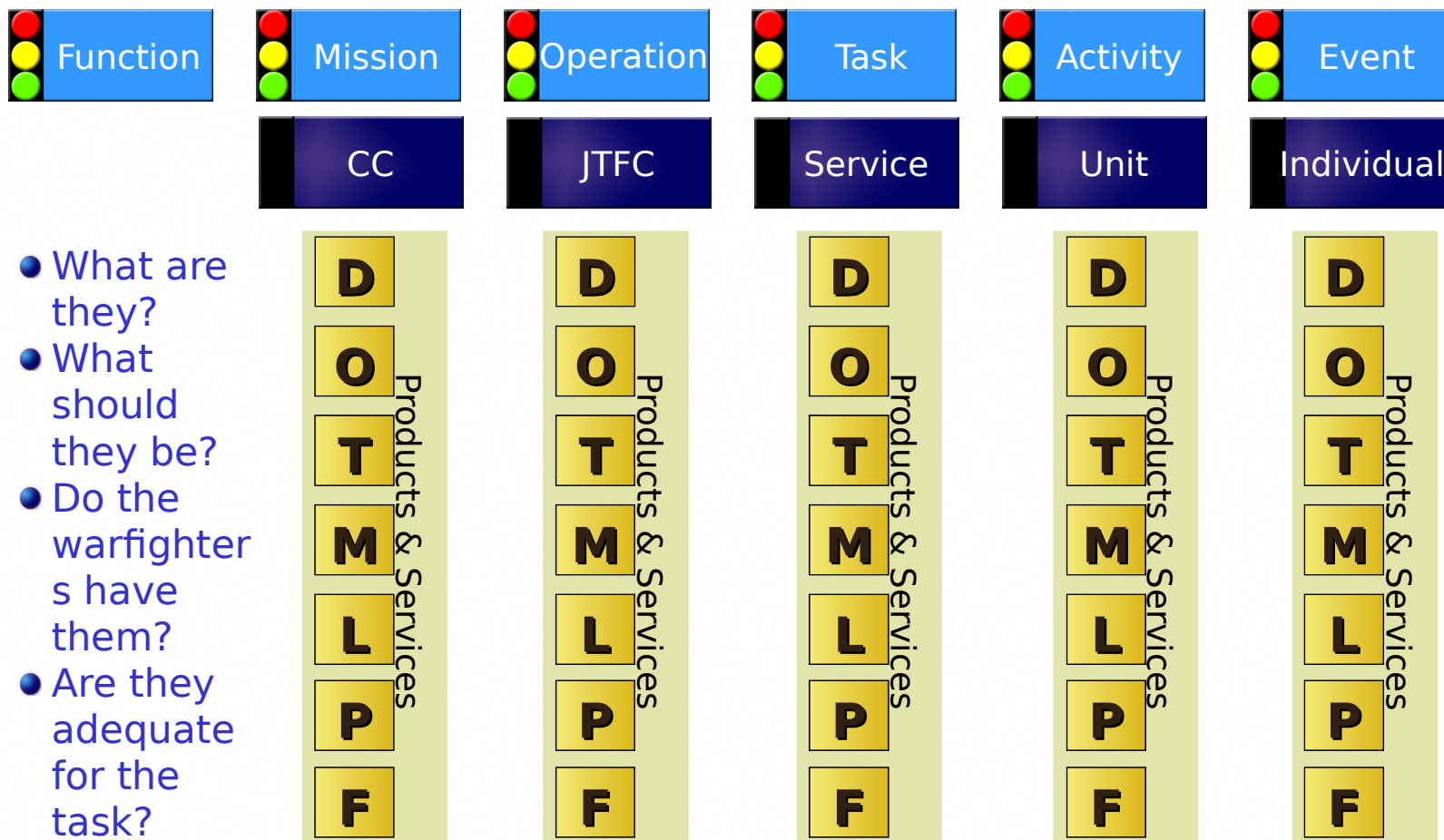
Performance

Employment operation. How will the system be used to attain present and current future military objectives? Consider conditions under which the system will be used.



# Full Spectrum Analysis

## Products & Services Mode





# Getting at the Right Issues

## Combination Mode

### Customers

**Combatant  
Commander**

**JTFC**

**Service**

**Unit**

**Individual**

**D**

**O**

**T**

**M**

**L**

**P**

**F**

Products & Services

#### *What*

Threat  
Capability gaps  
Present  
Projected future  
Technology application

Specific core  
deficiencies,  
problem areas, or  
opportunities stated  
as single issues

#### *Who*

**Doctrine**  
Strategy  
Policy  
Goals & Objectives  
Plans & Procedures  
**Organization**  
Ownership of Assets  
Decision Authority  
Command relationships  
**Material**  
Comm. interfaces  
**Training**  
Competencies  
Knowledge  
Skills  
Abilities  
New schools  
Process  
**Personnel, Facilities**  
Support Needs

Organization setting.  
Which organizations  
interface with the  
system? Address  
interfaces with other  
Joint Systems. Who  
will use the system  
when it is developed  
and fielded?

#### *When*

**Programmatic**  
Milestones  
Time frames  
Deadlines  
Deliverable dates  
FOS Synchronization  
P3  
Time phasing  
Spiral acquisition  
Spiral development  
**Operational**  
Phases of campaign  
IOC  
Deployment process

Time frames that will  
support acquisition  
approach. Milestones  
and/or dates to be  
delivered and fielded.  
Also consider phases of  
campaign

#### *Where*

**Place on the battlefield**  
Mobility  
Accessibility  
Survivability  
**Physical Environment**  
Facilities  
Terrain  
Weather & climate  
**Theater specific  
considerations**  
Supplies  
Transportation  
Deployment  
Installation  
Network  
Maintenance  
Civil considerations

The system's place on  
the future battlefield.  
Consider physical  
environment.

#### *How*

**Doctrine**  
TTP  
OPLANS  
Military conditions  
ROE  
**Leadership**  
Decision Support  
Information Mgmt  
Deployment  
**Material**  
Network  
Design  
Implementation  
FOS Integration  
Performance  
**Personnel**  
Performance

Employment operation.  
How will the system be  
used to attain present  
and current future  
military objectives?  
Consider conditions  
under which the system  
will be used.

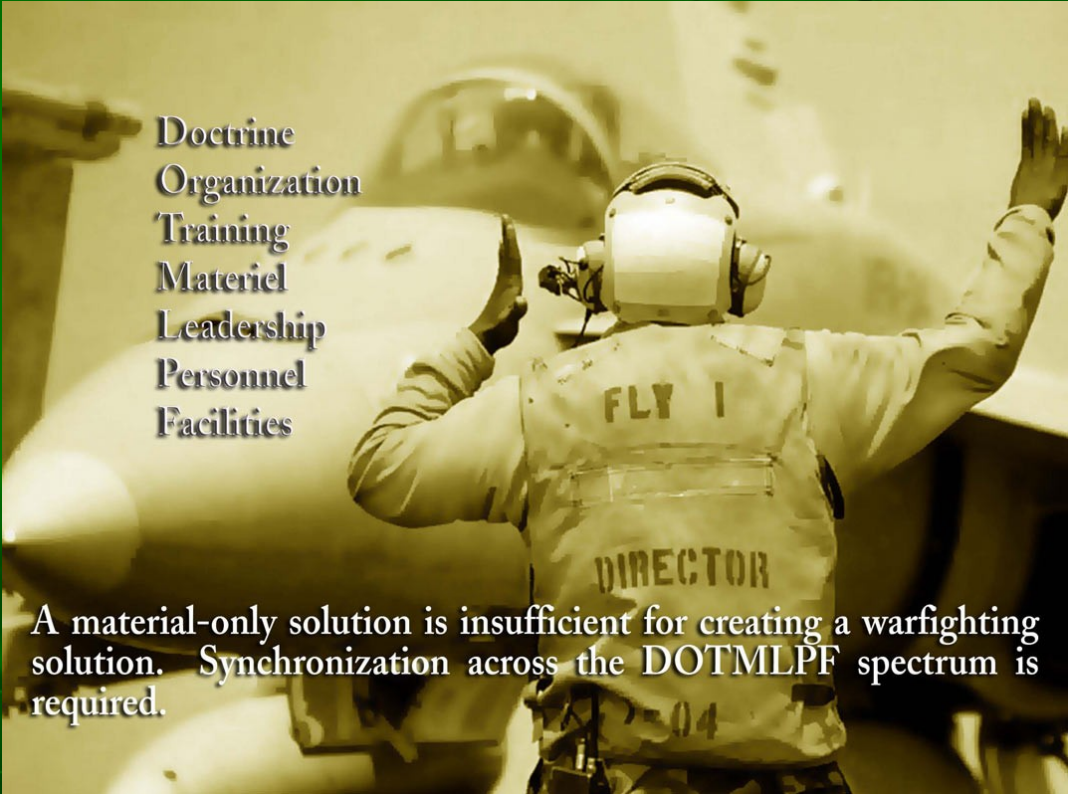


# A Good Issue Statement

- Singular
- Specific
- Clear
  - Who has the problem (capability)?
  - Where does it occur? (Where can it be applied?)
    - Organization
    - Geographical location
  - Is time/threat a factor?
  - Does the issue diminish performance?
- Complete



# DOTMLPF as an Analytical Tool



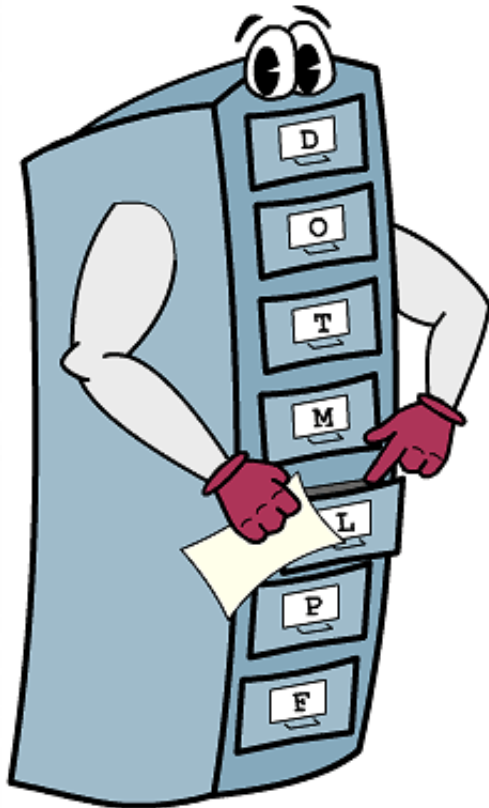
Doctrines  
Organization  
Training  
Materiel  
Leadership  
Personnel  
Facilities

A material-only solution is insufficient for creating a warfighting solution. Synchronization across the DOTMLPF spectrum is required.



# DOTMLPF

## Foundational Principles

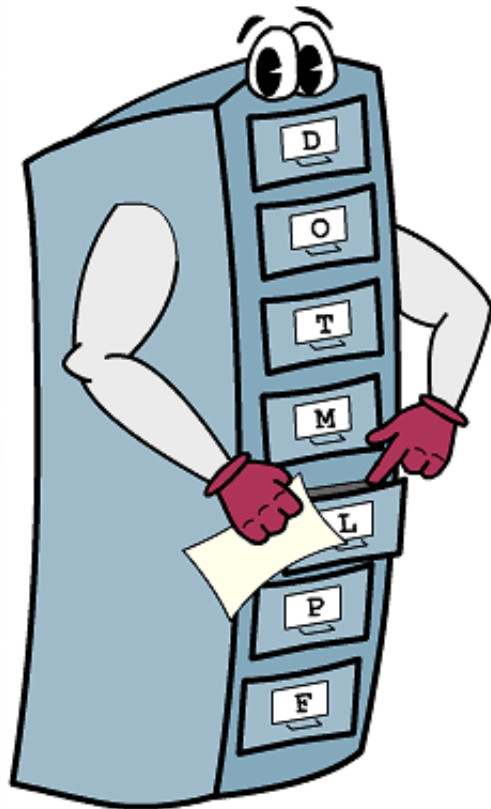


- DOTMLPF is like a big filing cabinet.
- Look at issues, operations, or business areas
  - breaking apart into more discrete, manageable sets of tasks and deliverables.
- Each component of DOTMLPF is like one of seven drawers in which to place different kinds of products and services the DOD needs to conduct business.
  - Contents of each drawer are the problems, issues, and technological, management, & implementation opportunities associated with that category



# DOTMLPF

## 3180 & the TCP



- If “M” = equipment (including hardware and software) physical materials, and other tangible products used in the delivery of a capability, and
- “solutions” = the reliable and dependable delivery of capability to achieve operational objectives, and
- Solutions > m...
- Consider the following equation:

$$D + O + T^5 + M + L + P^2 + F = \text{solution}$$

This means that the FCBs should be looking for a DOTMLPF Transformation Package for almost *every* program. (The exception could be self-installing vehicles tires, peanut butter snacks, and buttons.)



# DOTMLPF

## ● Doctrine

- Doctrine publications
- TTP
- Operating procedures
- Regulations
- Checklists
- Policy which governs or guides the way the military conducts business

## ● Organization

- Actual organizations needed to conduct an operation or business
- The visual representation of those organizations
- Organizational characteristics
- Opportunities and challenges in utilizing them to perform an operation or conduct business

## ● Training

- training content
- all methods of delivering that content to its intended audience which enables performance and support of the mission



# DOTMLPF

## ● Materiel

- Traditionally what has been associated with the defense acquisition process
  - Weapons
  - Platforms
  - communication equipment
  - medical equipment
  - Transportation
  - training software
- Even though materiel may be used to directly perform a mission, it may also support another DOTMLPF component which supports the mission – especially facilities and training.



# DOTMLPF

## ● Leadership

- Management and implementation of change across the DOTMLPF spectrum

## ● Personnel

- Primarily to ensure that qualified personnel are there to support a capability
  - Identification of the knowledge, skills, abilities, and competencies needed to perform a position, job, or task
  - Creation of new occupational specialties to support new missions, threats, and technologies
  - Revision of those specialties over a period of time

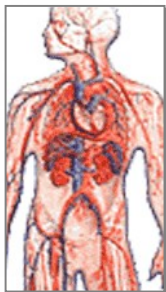
## ● Facilities

- Supplies
- Engineering support
- Much of what is associated with logistics
  - Think...buildings, roads, runways, and infrastructure and the activities it takes to build and maintain them to support performance of operations



# DOTMLPF

## DOTMLPF as a Diagnostic Tool



To properly diagnose an ailment, it would be unthinkable for a medical doctor to presuppose the source of an underlying medical problem or just check one anatomical system then prescribe a course of treatment. Similarly, it would be unthinkable for military organization to examine only one component of DOTMLPF and prescribe a course of treatment or solution.

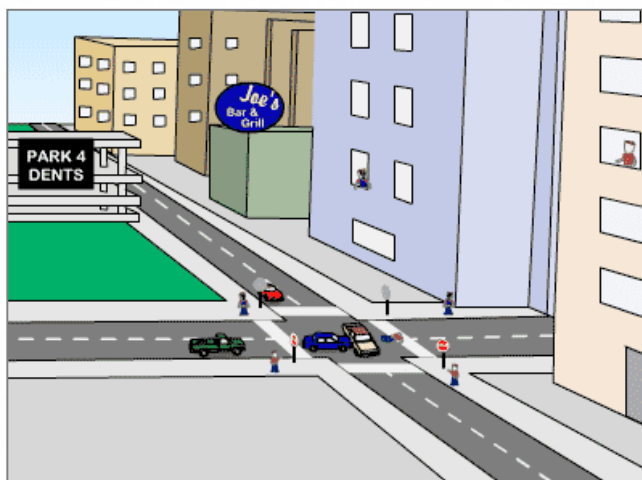
Consider any basic human activity. Walking involves the circulatory system, the nervous system, the respiratory system, the skeletal system, and the muscular system. Eating involves the digestive system AND the nervous system. Both systems work together to deliver that “capability.” In the same way, putting a bomb on target requires a lot more than a properly designed material system.



# DOTMLPF

## DOTMLPF as an Investigative Tool

To draw proper conclusions and take a necessary course of action to solve a problem or deal with a situation, you must have all the pertinent facts. The degree to which you have not collected all of the pertinent facts is directly proportional to how valid and correct (or invalid and incorrect) your conclusions are and your case or proposed solution will be.



Solving operational issues and deficiencies in the Department of Defense is no exception.

DOTMLPF can be an effective tool in investigating and gathering all the pertinent data you need to draw conclusions needed to formulate a complete, relevant, and correct set of requirements for solving operational issues and deficiencies. It can help you gain the proper aspect, perspective and gain the analytical vantage point needed to clearly see the true nature of a problem.



# DOTMLPF Analysis

## Doctrine

- Is there existing doctrine that addresses the issue or relates to the issue? Joint? Service? Agency?
- Are there operating procedures in place that are NOT being followed which contribute to the issue? Which could, at least in part, correct the issue or lessen its impact?
- If no doctrine or procedures are in place which pertain to the issue, does new doctrine or do new procedures need to be developed and implemented which provide either a complete or partial solution to the issue?



# DOTMLPF Analysis

## Organization

- Where is the problem occurring? What organizations is the problem occurring in?
- What is the mission/management focus of those organizations?
  - Primary and secondary missions
- What are the organizational values and priorities?
- Is the organization properly staffed and funded to deal with the issue?
- Are commanding officers/senior management aware of the issues?
- Is the issue already in some type of organizational issue list (CC IPL)?
- If so, why isn't the issue being resolved?
- Who exactly is aware of/impacted by the issue?
  - Troops?
  - Services?
  - JTF staff?



# DOTMLPF Analysis

## Training

- Is the issue caused, at least in part, by a complete lack of or inadequate training?
- Does training exist which addresses the issue?
- Is the training being delivered effectively?
- How are training results being measured and monitored?
- Is the issue caused by a lack of competency or proficiency on existing systems and equipment?
- Was the issue discovered in an exercise?
- Do personnel effected by the issue have access to training?
- Is command/management supporting and/or enforcing the training effort?
- Is training properly staffed and funded?



# DOTMLPF Analysis

## Material

- Is the issue caused, at least in part, by inadequate systems or equipment?
- What current systems are in the Family-of-Systems where the problem is occurring?
- What functionality would a new system provide that currently does **not** exist?
- What increases in operational performance are needed to resolve the issue?
- Is the issue caused by a lack of competency or proficiency on existing systems and equipment?
- Can increases in performance be achieved without development of a new system? If so define.
- Who would be the primary and secondary users of the proposed systems or equipment?



# DOTMLPF Analysis

## Leadership

- Is the issue caused, at least in part, by inability or decreased ability to cooperate/coordinate/ communicate with external organizations?
- Do the senior officers understand the scope of the problem?
- Does command have resources at its disposal to correct the issue?
- Is leadership being trained on effective change management principles?
- Has command properly assessed the level of criticality, threat, urgency, risk, etc. of the operational results of the issue?
- Is senior leadership aware of the drivers and barriers to resolving the issue within her/his own organization?
- Has senior leadership identified interservice/agency cultural drivers and barriers which hinder issue resolution?
- Does the issue effect CC or JTF's conduct Joint operations?



# DOTMLPF Analysis

## Personnel

- Is the issue caused, at least in part, by inability or decreased ability to place qualified and trained personnel in occupational specialties?
- If issue resolution is likely to involve new material, systems, or equipment, are different occupational specialty codes needed to properly staff new systems?
  - Primary users
  - Maintenance personnel
  - Support personnel
- Do new training programs need to be developed for newly recruited personnel?



# DOTMLPF Analysis

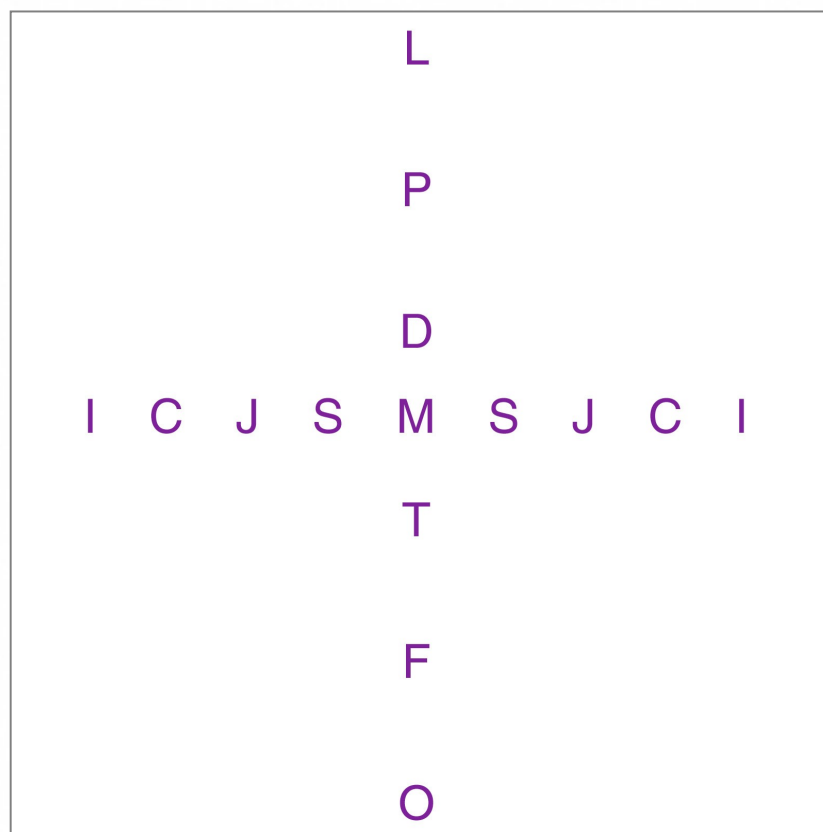
## Facilities

- Is the issue caused, at least in part, by inadequate infrastructure?
- If so, was issue a result of
  - Aging/wear?
  - New engineering didn't meet needs?
  - Battle damage/threat?
- Was issue caused by lack of proper environmental controls?
- Issue caused, at least in part, by inadequate
  - Roads/trails?
  - Main supply routes?
  - Force beddown?
  - Facilities operation and maintenance?
  - Hardening?
  - Field fortification support?
  - Etc?



# What You Don't Know *Can* Kill You

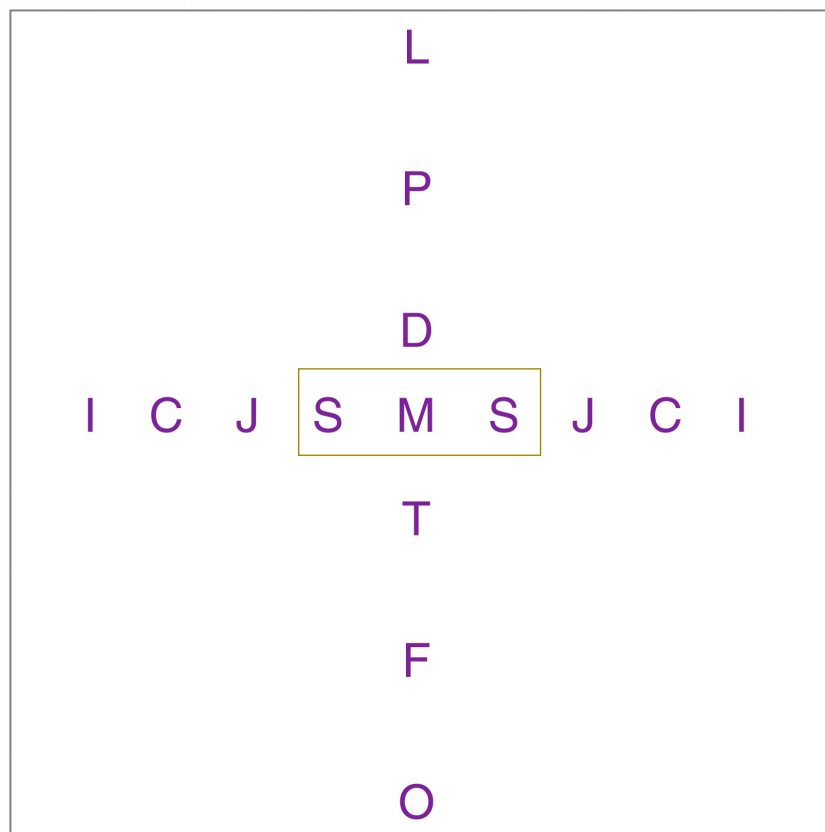
## Eyes Wide Shut





# What You Don't Know *Can* Kill You

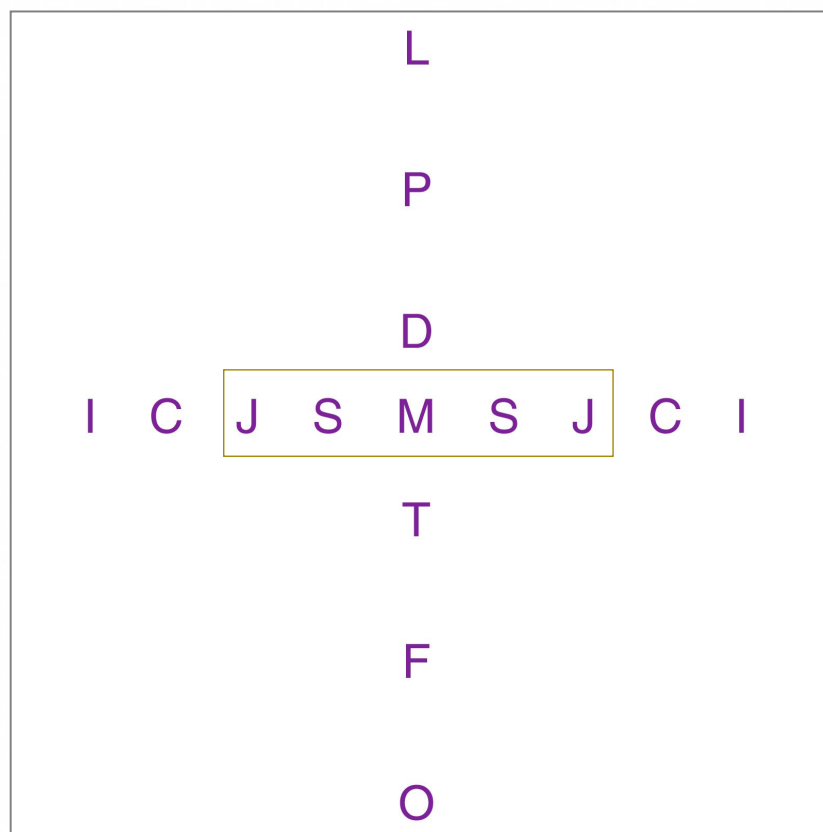
## Eyes Wide Shut





# What You Don't Know *Can* Kill You

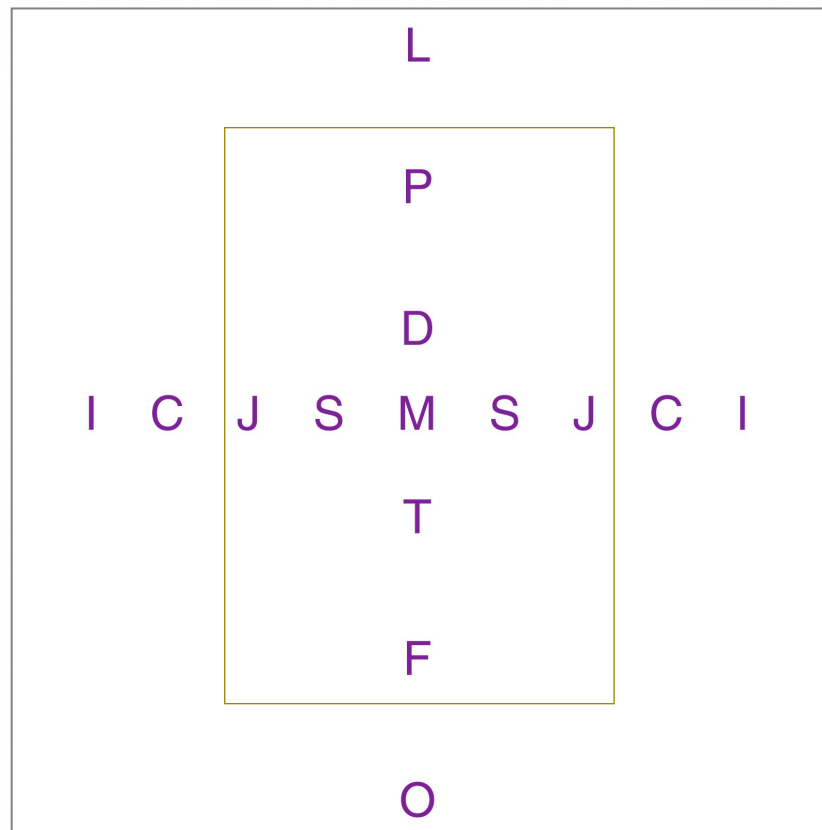
## Eyes Wide Shut





# What You Don't Know *Can* Kill You

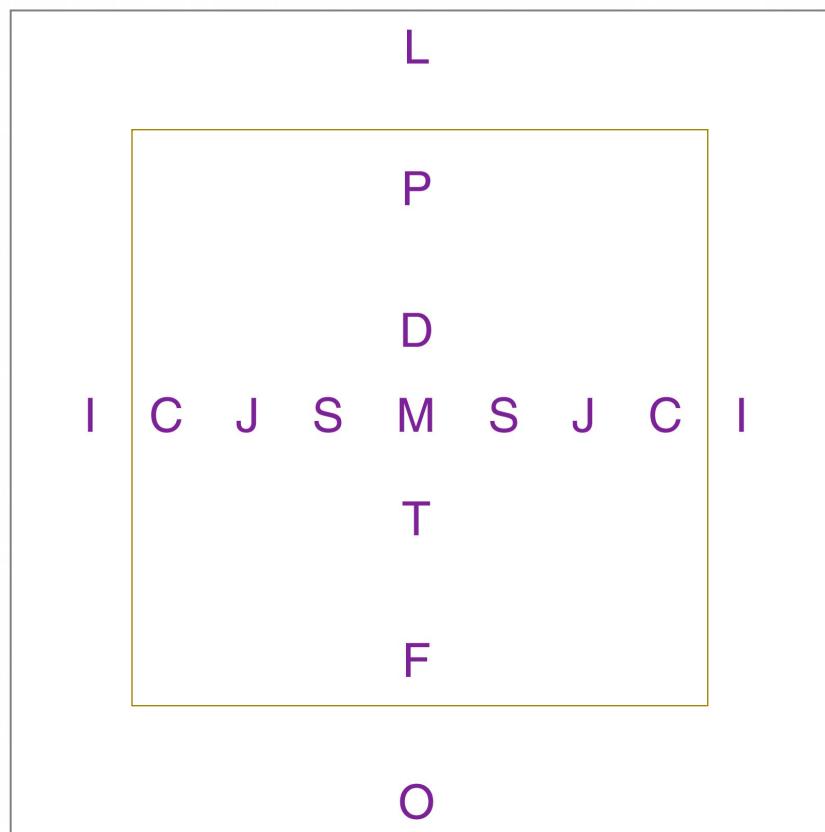
## Eyes Wide Shut





# What You Don't Know *Can* Kill You

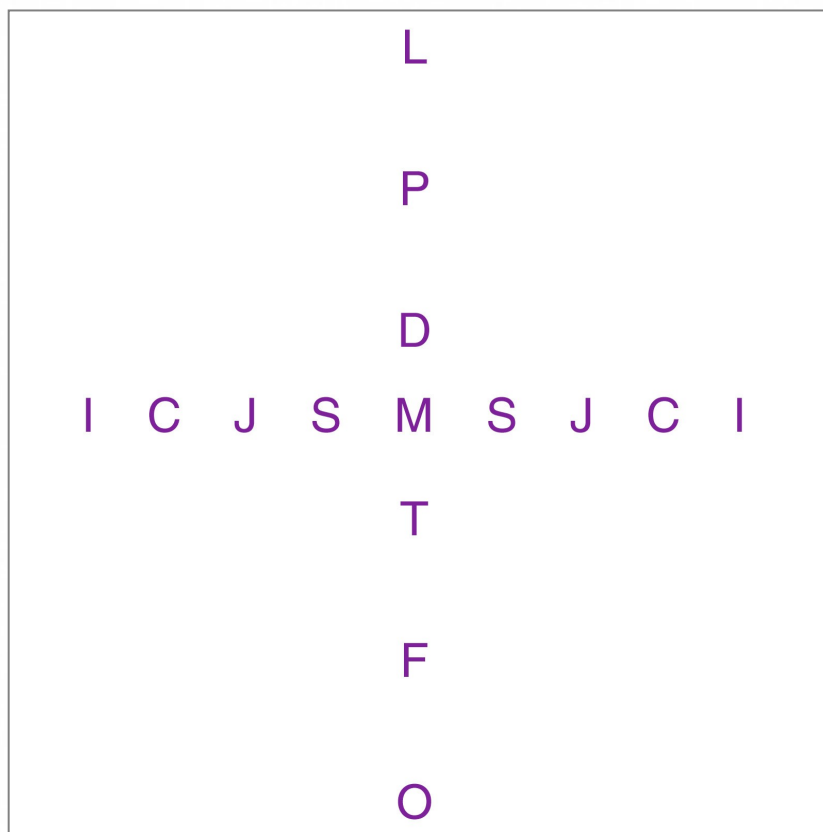
## Eyes Wide Shut





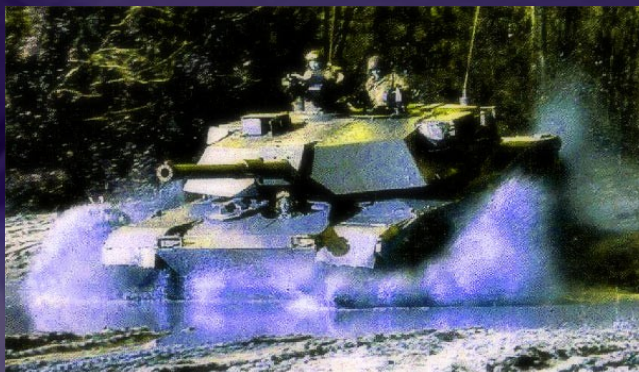
# What You Don't Know *Can* Kill You

## Eyes Wide Shut





# Operational Concept





# The Dreaded Operational Concept

Used to gain consensus

Communicate a vision

Context to preserve the intent of requirements as operational requirements migrate into system and other technical documents and specifications

Should address change: Compare and contrast

In the past... today... We currently... In the future... The focus was...

The result was... This results in... In order to... Instead, we will...

Features & benefits

Simple, everyday language

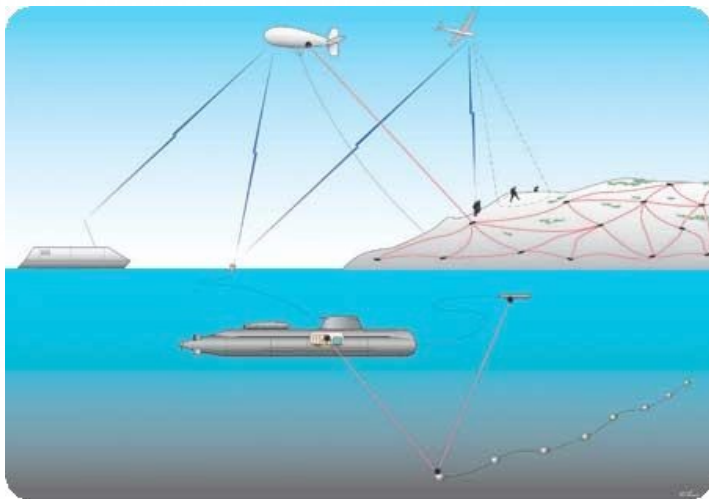
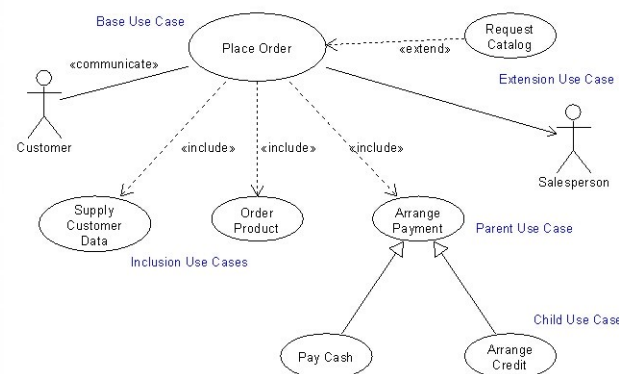


Chart ID : Use Case Relationships  
Chart Name : Use Case Relationships  
Chart Type : UML Use Case Diagram



K.I.S.S.

Requirements might be controversial. Operational concepts shouldn't be.

"A day in the life" of your system or product

Normal vs. abnormal use

Consider "what ifs."

Know all your users - primary and secondary.

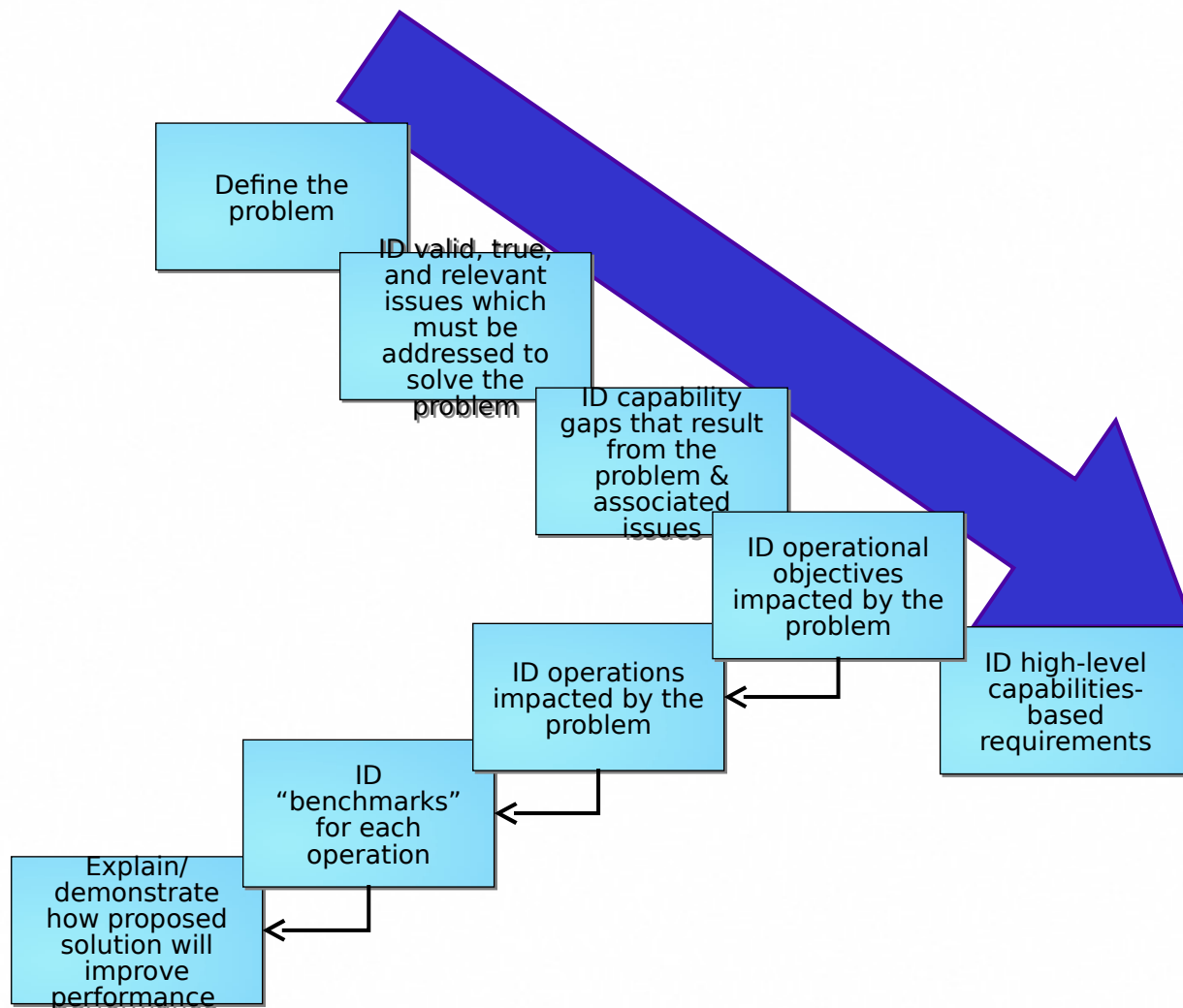
Understand the business processes the system or product will support.

Understand the limitations and constraints under which the system or product will be used.

If possible, shop the concept around to end users of the system.



# Before You Can Write a Good Ops Concept...





# What's in an Ops Concept?

- What's the warfighter pain?
- How will proposed solution alleviate warfighter the pain? Improve warfighter performance?
- Address major operational “use cases” in which proposed solution will be applied
- ID how solution will help achieve functional and Joint Operational Concepts
- Identify Families-of-Systems and/or System-of-Systems in which solution will be employed
- Explain high-level, implementation approach and considerations
- Spiral acquisition approach



# Operational Concept Matrix

State purpose, goals, and overarching capability in terms of warfighter benefits. (Why?)

Major Functional Areas

→ Subfunctions (portfolios)

→ Operations

→ System Types

|        | Issue | Capability Gap | Operational Objective | Capability-based Req | Condition of Success | Cost of Failure | Attribute | Threshold | Obj | Risk | Joint Operation |
|--------|-------|----------------|-----------------------|----------------------|----------------------|-----------------|-----------|-----------|-----|------|-----------------|
| What?  |       |                |                       |                      |                      |                 |           |           |     |      |                 |
| Who?   |       |                |                       |                      |                      |                 |           |           |     |      |                 |
| When?  |       |                |                       |                      |                      |                 |           |           |     |      |                 |
| Where? |       |                |                       |                      |                      |                 |           |           |     |      |                 |
| How?   |       |                |                       |                      |                      |                 |           |           |     |      |                 |



# The Requirement

## Prototyping the Solution

- Basic statement
  - The ability of who to do what under what set of conditions.
  - The ability of the JTF to destroy mobile scud launchers in the Iraqi desert before they launch.
- Each DOTLPF area has a “template” set of requirements that pertain to it
  - i.e. Training
    - The ability to train ...
    - The ability to assess training results...
    - The ability to assess performance...
    - Ability to assess competency...
    - Ability to perform...
    - etc.



# The Requirement

## Prototyping the Solution

### *Formatting the Requirement*

- The “*who*” is either a Combatant Commander, a JTFC, a Joint Component, a Service, an Agency, a Unit, a team, or an individual warfighter.
- The “*what*” could be a JMA, operation, task, activity, or event
- Operational requirements should be stated in terms of mission accomplishment - *not in terms of physics*. State the requirements, not how you think a developer or designer should meet the requirements. That will be addressed in the Performance Requirements.



# The Requirement

## *Inherent Requirements - Doctrine*

- Capability to *develop* doctrine
  - Timeliness, accuracy, completeness, suitability, usability
- Capability to *revise* doctrine
  - Timeliness, accuracy, completeness
- Capability to *test* new TTP and doctrine
  - Timeliness, accuracy, repeatability, data integrity, suitability
- Capability to *publish/articulate* doctrine
  - Timeliness, accuracy, suitability, usability
- Capability to develop *TTP products* for doctrine
  - Timeliness, accuracy, suitability, usability
- Capability to develop new *policy and instructions* or revise existing policy and instructions to reflect new doctrine
  - Timeliness, accuracy, suitability, usability
- Capability to revise *operational architecture* to reflect new doctrine
  - Timeliness, accuracy, completeness
- Capability to review and revise *operational concepts* based on new doctrine
  - Timeliness, accuracy, completeness
- Capability to *train personnel* on new doctrine
  - See attributes for Training Requirements



# The Requirement

## *Inherent Requirements - Training*

- Capability to provide training
  - Timeliness, completeness, accuracy, verifiability, availability, repeatability, interoperability
- Capability to establish recurring/remedial training program
  - Timeliness, availability, repeatability
- Capability to demonstrate competency
  - Mastery (skill), aptitude, performable, completeness
- Capability to measure competency
  - Observability, accuracy, quantifiability
- Capability to monitor proficiency
  - Observability, verifiability, completeness, recordability, accuracy, traceability
- Capability to establish/ascertain criteria in the field which constitute success
  - Completeness, accuracy, availability



# The Requirement

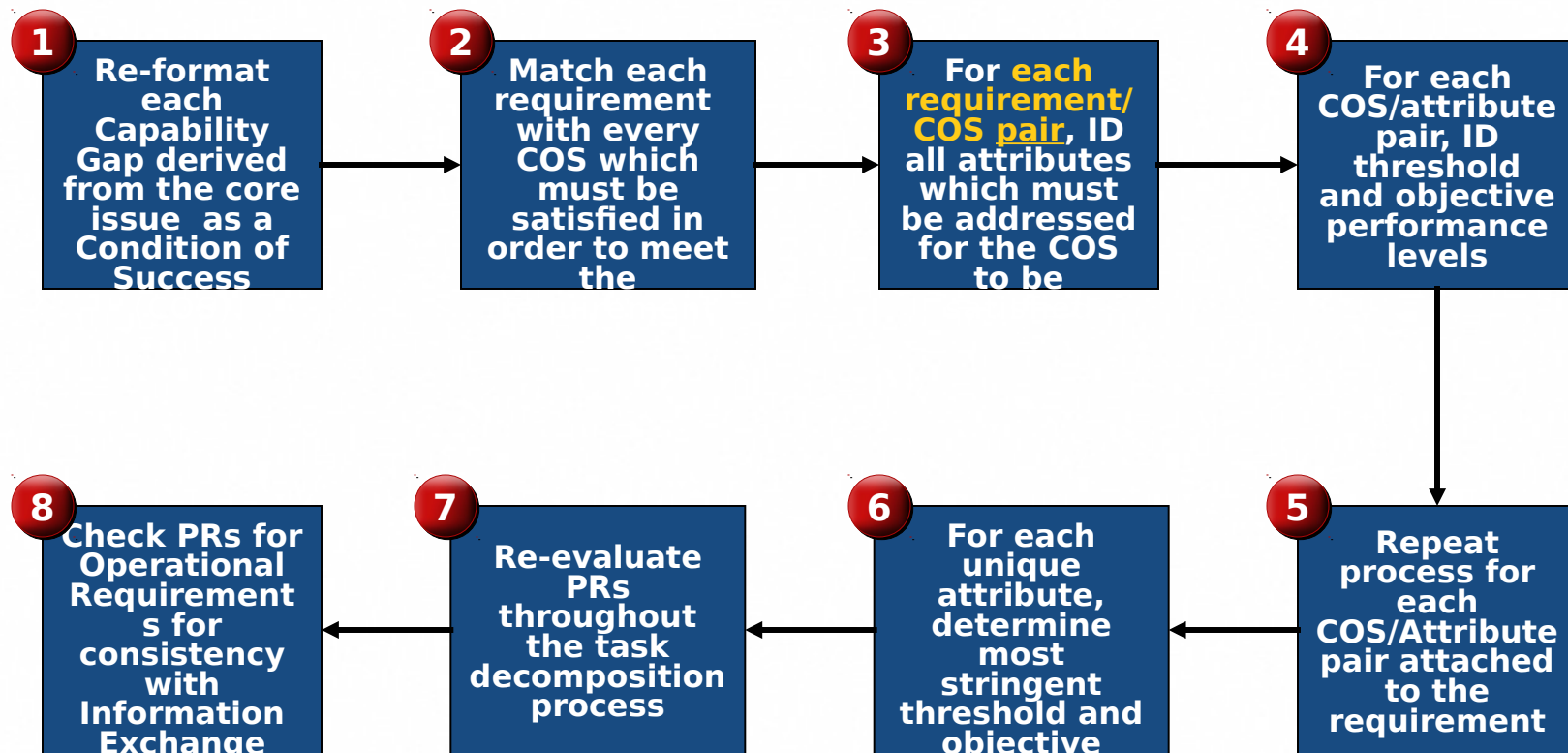
## Prototyping the Solution

### *Inherent Requirements - Training*

- Capability to of Force Com to provide training for new e-tac personnel
  - Timeliness, completeness, accuracy, verifiability, availability, repeatability, interoperability
- Capability of Force Com to establish recurring/remedial training program for e-tac personnel
  - Timeliness, availability, repeatability
- Ability to new e-tac personnel to demonstrate competency on Joint Fires (Air) procedures and systems
  - Mastery (skill), aptitude, performable, completeness
- Capability to Force Com/unit commanders to measure competency of new e-tac personnel across services
  - Observability, accuracy, quantifiability
- Capability to Joint /unit commanders to monitor proficiency of e-tac personnel under their command
  - Observability, verifiability, completeness, recordability, accuracy, traceability
- Capability to Joint and service operational communities to establish/ascertain operational performance criteria for e-tac personnel which constitute success
  - Completeness, accuracy, availability

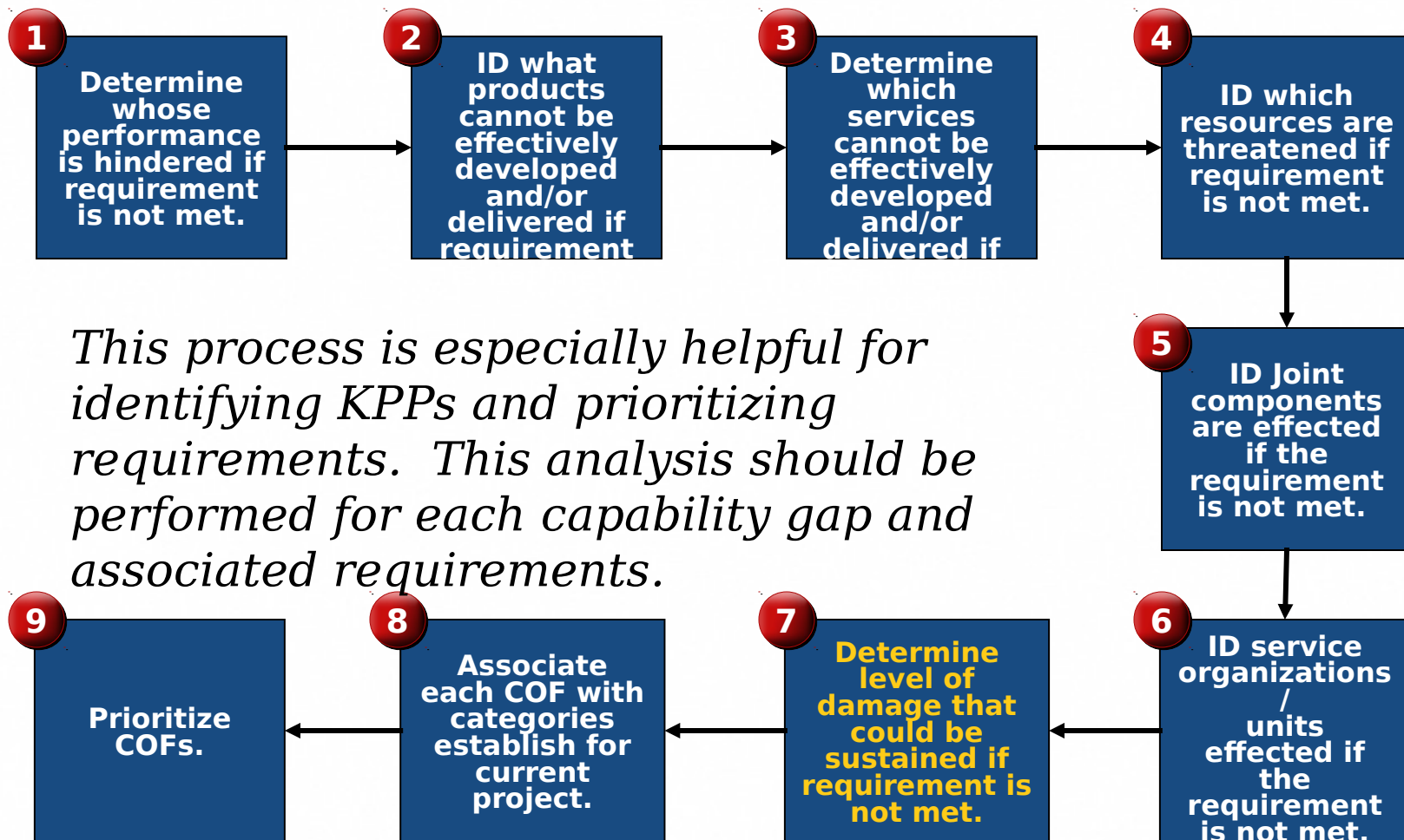


# Establish Performance Requirement



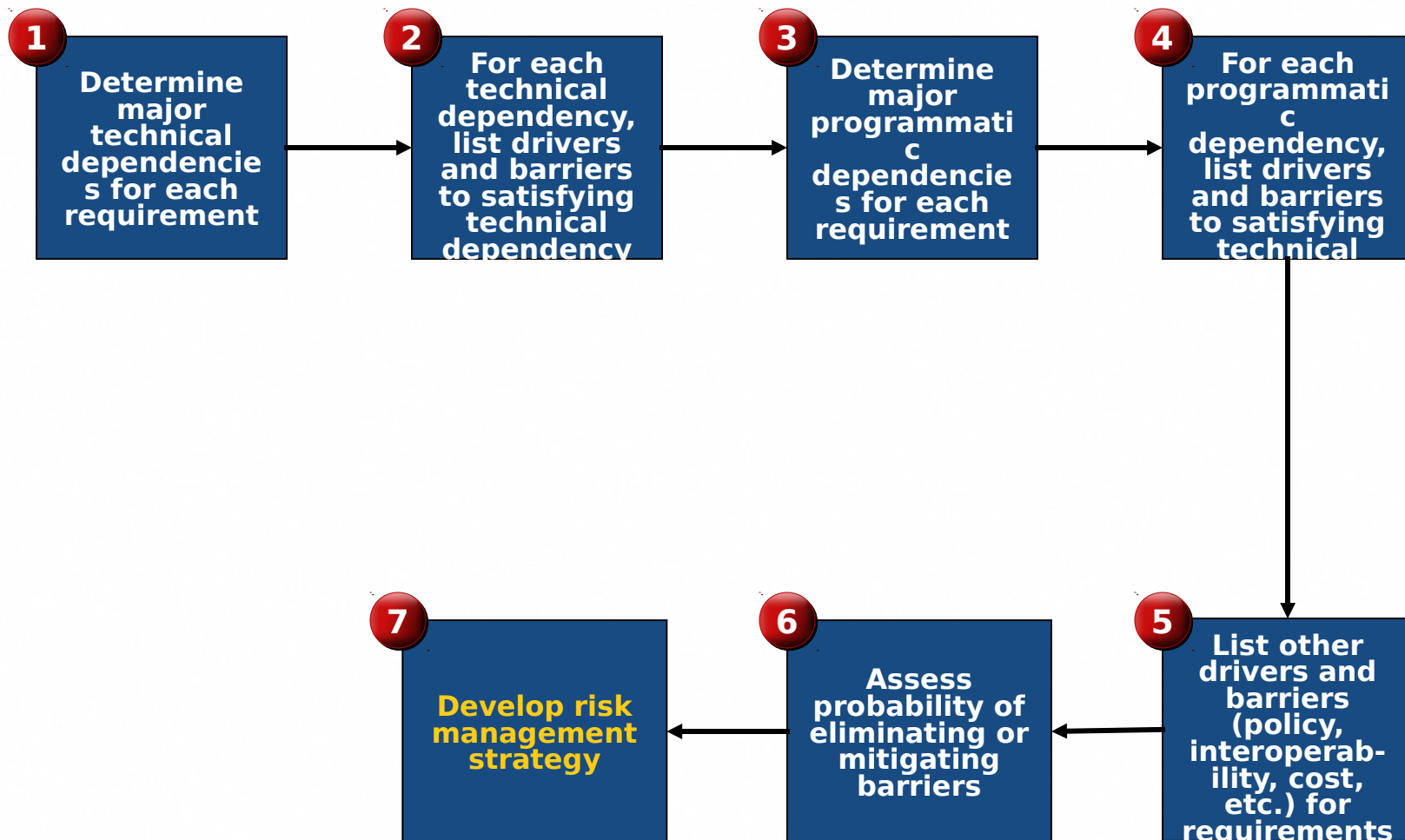


# Cost of Failure





# Determine Risks





# Architecture

“A horse in the cart is worth two on the drawing board”



0  
1  
.  
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5  
-  
9  
9  
5  
8



# Define the Family of Systems

## Understanding the Need

### *Family of Systems Matrix - Operational View*

| Function | Planning<br>Activities | Coordination<br>Activities | Execution<br>Activities | Types<br>Systems | Army |    | AF |    | Navy |    | MC |    | Joint |    | Interoperability<br>Issues |
|----------|------------------------|----------------------------|-------------------------|------------------|------|----|----|----|------|----|----|----|-------|----|----------------------------|
|          |                        |                            |                         |                  | C    | KF | C  | KF | C    | KF | C  | KF | C     | KF |                            |
|          |                        |                            |                         |                  |      |    |    |    |      |    |    |    |       |    |                            |
|          |                        |                            |                         |                  |      |    |    |    |      |    |    |    |       |    |                            |
|          |                        |                            |                         |                  |      |    |    |    |      |    |    |    |       |    |                            |
|          |                        |                            |                         |                  |      |    |    |    |      |    |    |    |       |    |                            |
|          |                        |                            |                         |                  |      |    |    |    |      |    |    |    |       |    |                            |

- Interoperability issues
  - Connectivity
  - Processing (network design)
  - Protocols and standards
  - Display
  - DOTMLPF (for each command)
  - Other in-theater drivers and barriers to interoperability



# Where Does Architecture Fit?

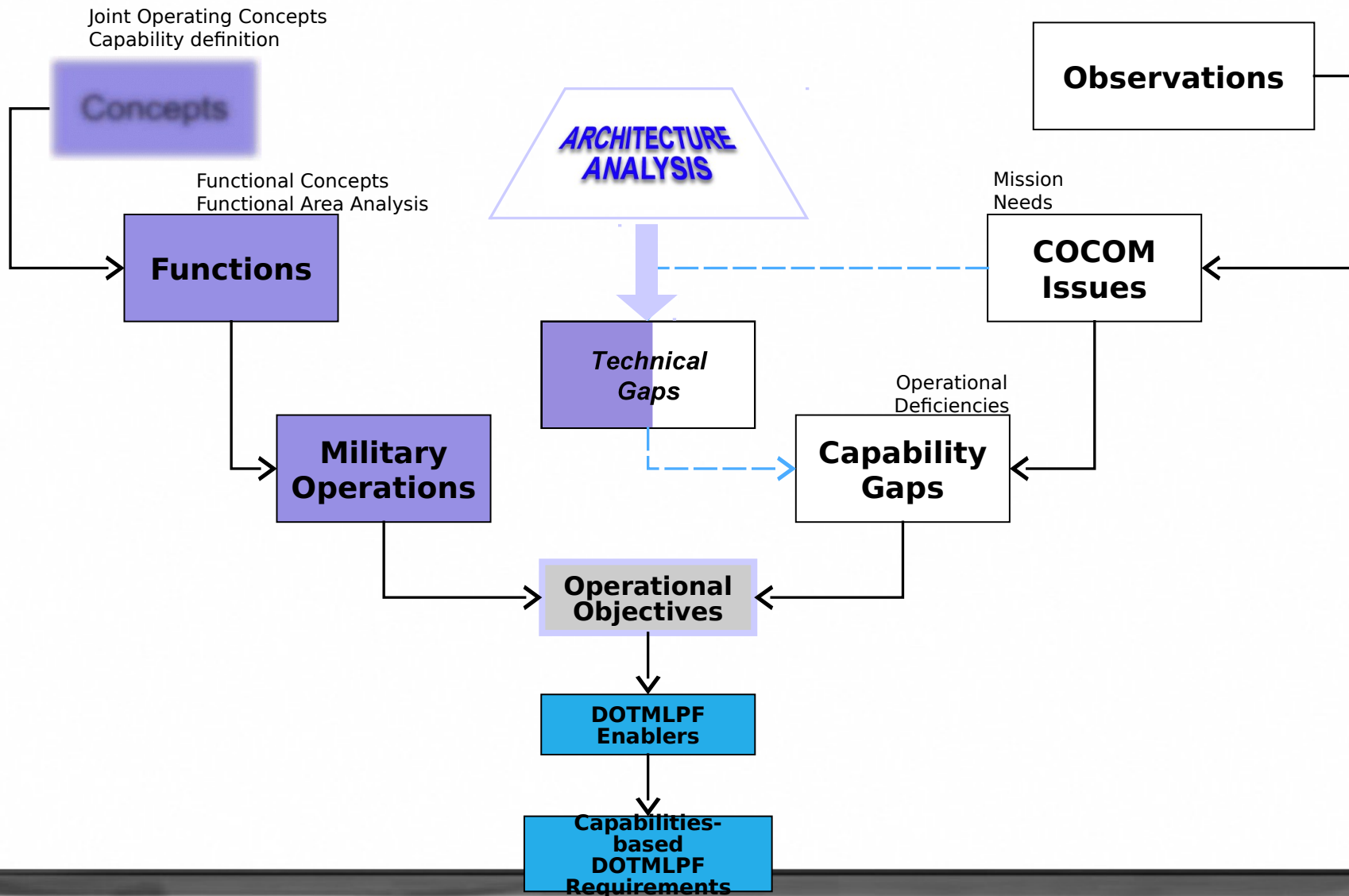
## Prototyping the Solution

- *If you can develop a set of DOTMLPF capabilities-based requirements without referencing architecture products, integrated or otherwise, then what purpose do architectures serve?*
- Architectures
  - Provide a basis for double-checking the requirements
  - Provide a realistic context in which to interpret the requirements
  - Provide the basis for developing system requirements and specifications which will provide the “value added”
  - Provide the delta between the “as is” views and the “to be” views provides important information needed to
    - Make decisions on spiral acquisition
    - Determine whether or not spiral development will be required to provide a solution
    - Determine the spiral development approach
  - Help analysts and technical experts identify possible technical gaps which may not have been observed or experienced in field operations or exercises, or found in tests, evaluations, or assessments



# Capabilities Building Blocks

## Architecture is Just a Piece of the Puzzle







# Operational View - OV 1

## Prototyping the Solution

### ***A Summary View***

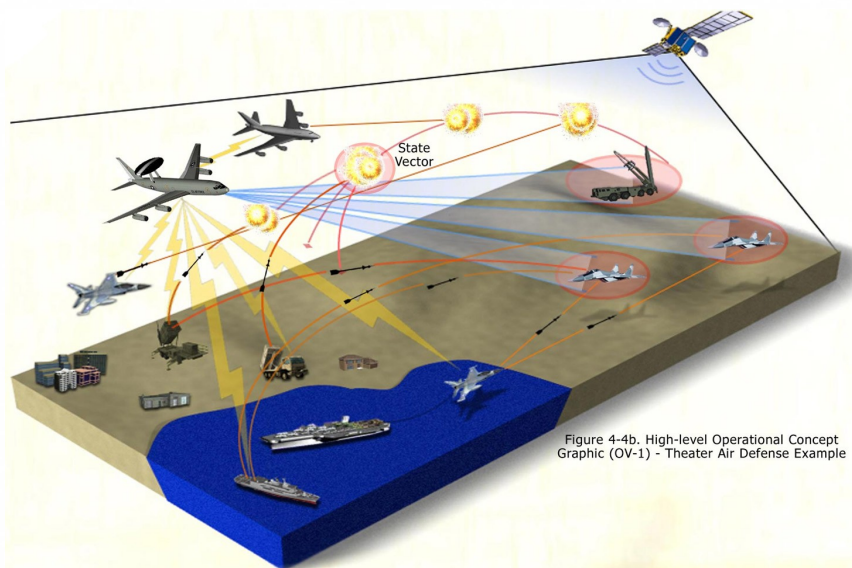


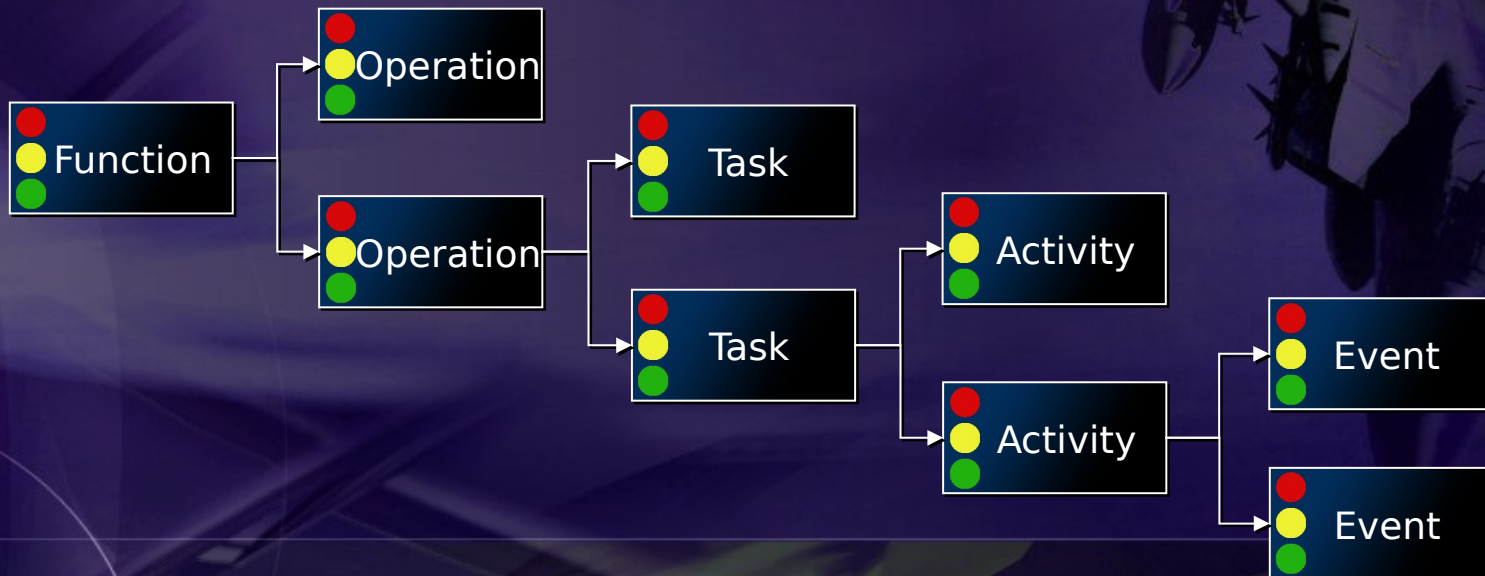
Figure 4-4b. High-level Operational Concept Graphic (OV-1) - Theater Air Defense Example

- OV 1 should be derived from an Operational Concept - not vice versa
- OV 1 can be useful in visualizing attributes (both operational and system) associated with a requirement
- Illustrate Family of Systems by function



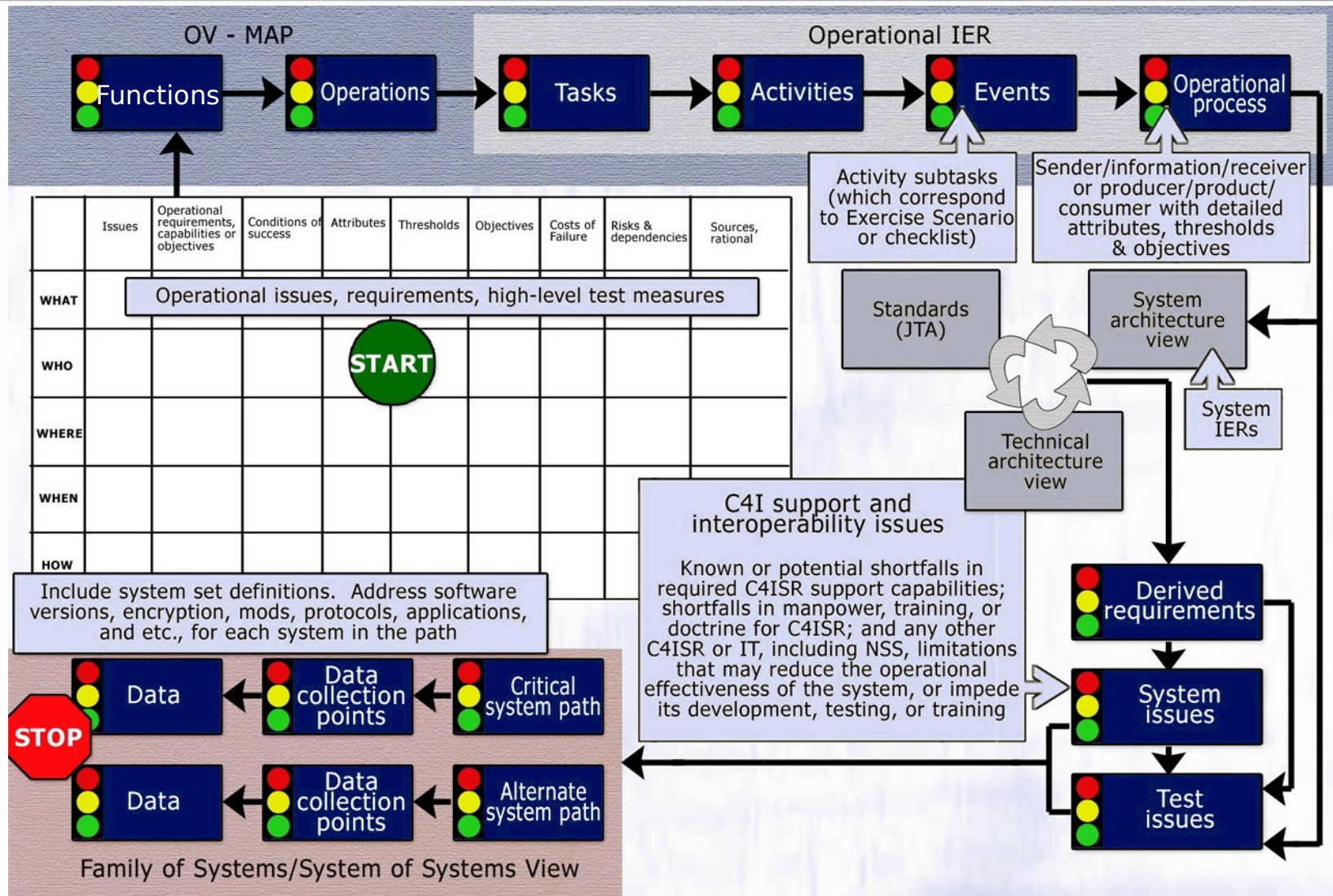
# Mission Assessment Process

## Building Operational Architecture Views



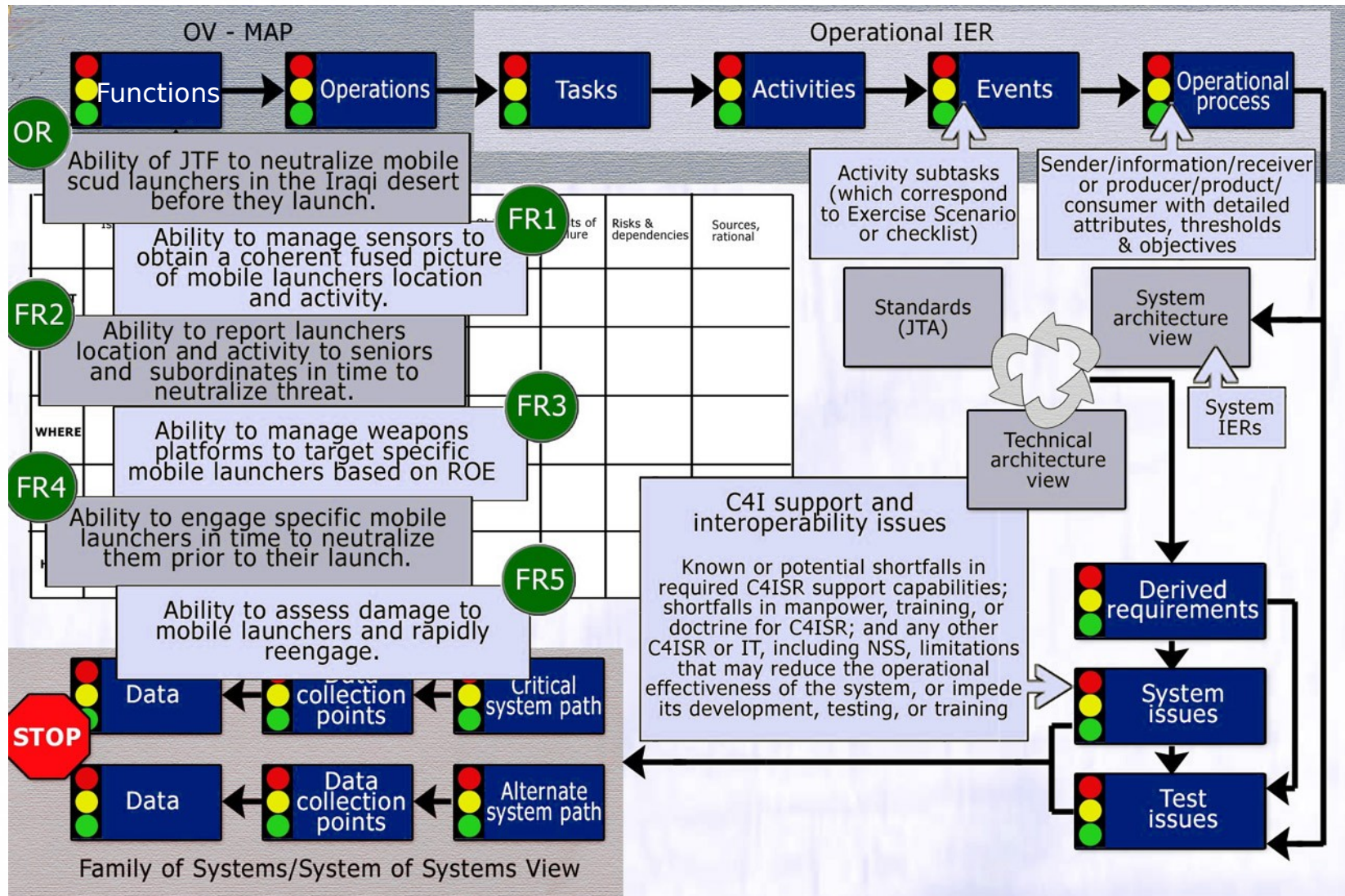


# Mission Assessment Process





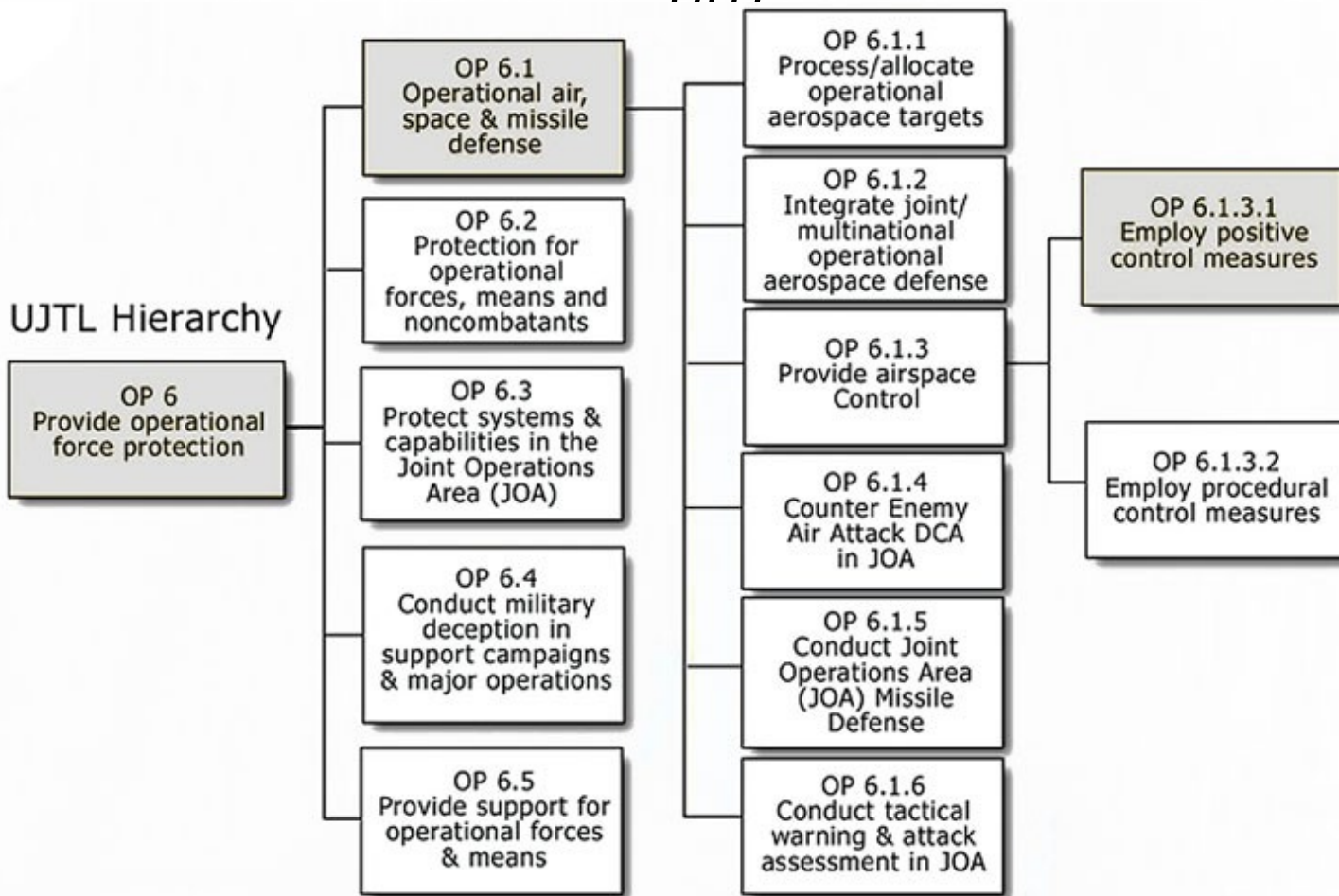
# Mission Assessment Process





# Mission Assessment Process

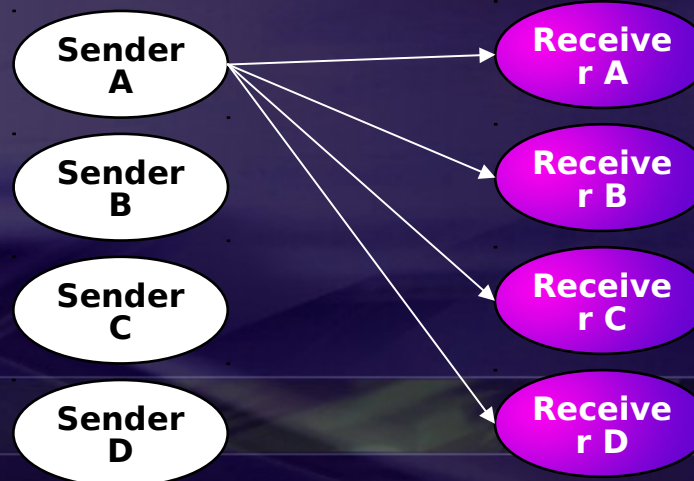
## *Navigating the IITI*





# Information Exchange Requirements

“Requirement Is My Last Name”



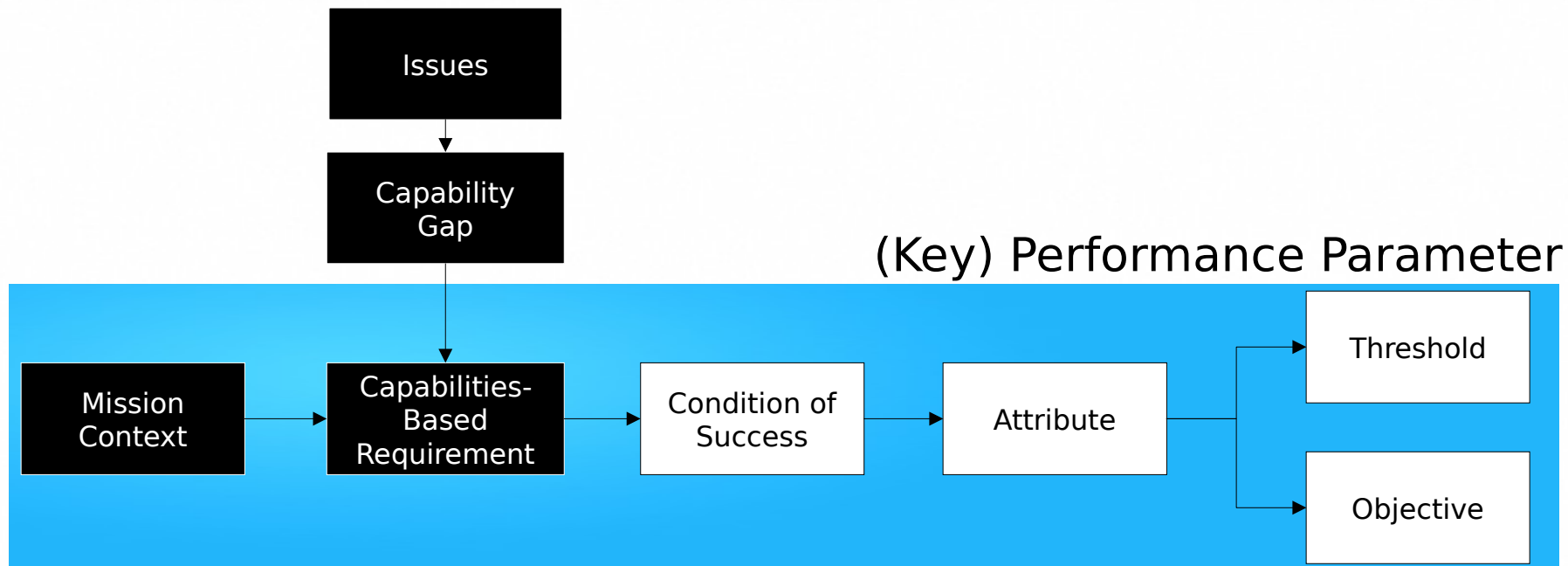


# What is an IER?

- The 3170 defines “Information Exchange Requirement” as the requirement for information to be passed between and among forces, organizations, or administrative structures concerning on-going activities
- Quality (i.e. frequency, timeliness, security) and quantity (i.e. volume, speed, and type of information such as data, voice, and video) are attributes of the information exchange included in the IER
- All you need to understand at this point is that an operational IER should tell you:
  - **Who** is sending the information
  - **What information** is being sent
  - **Why** the information is being sent
  - **Who is receiving** the information
  - How the information must be passed for the warfighter **mission, business process, or transaction to be completed successfully**

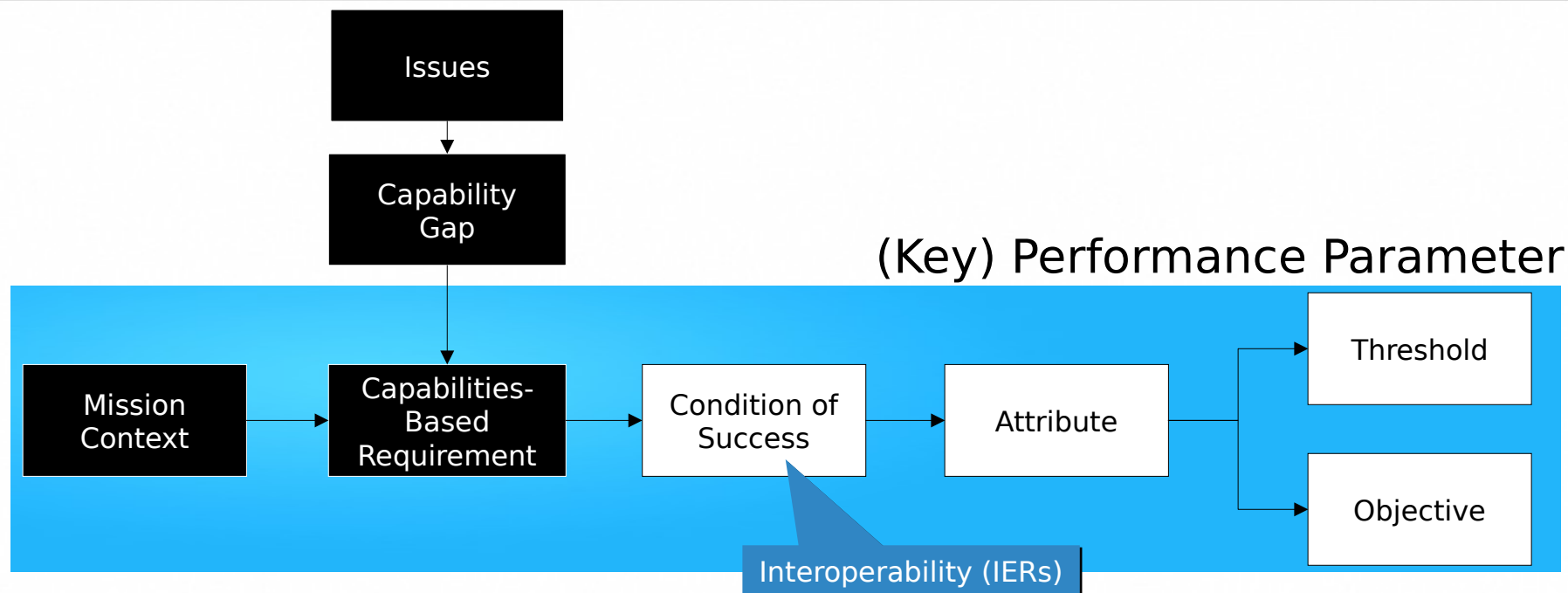


# What is an IER?





# What is an IER?



- ✓ When an information exchange is inherent in a requirement, the IER is a **Condition of Success** for that requirement. The IER is necessary, but not sufficient, for meeting that requirement.
- ✓ If the operational requirement is key or critical, the IERs associated with it are key or critical.
- ✓ Inversely, if the operational requirement is ***not*** key or critical, the IERs associated with it are ***not*** key or critical.

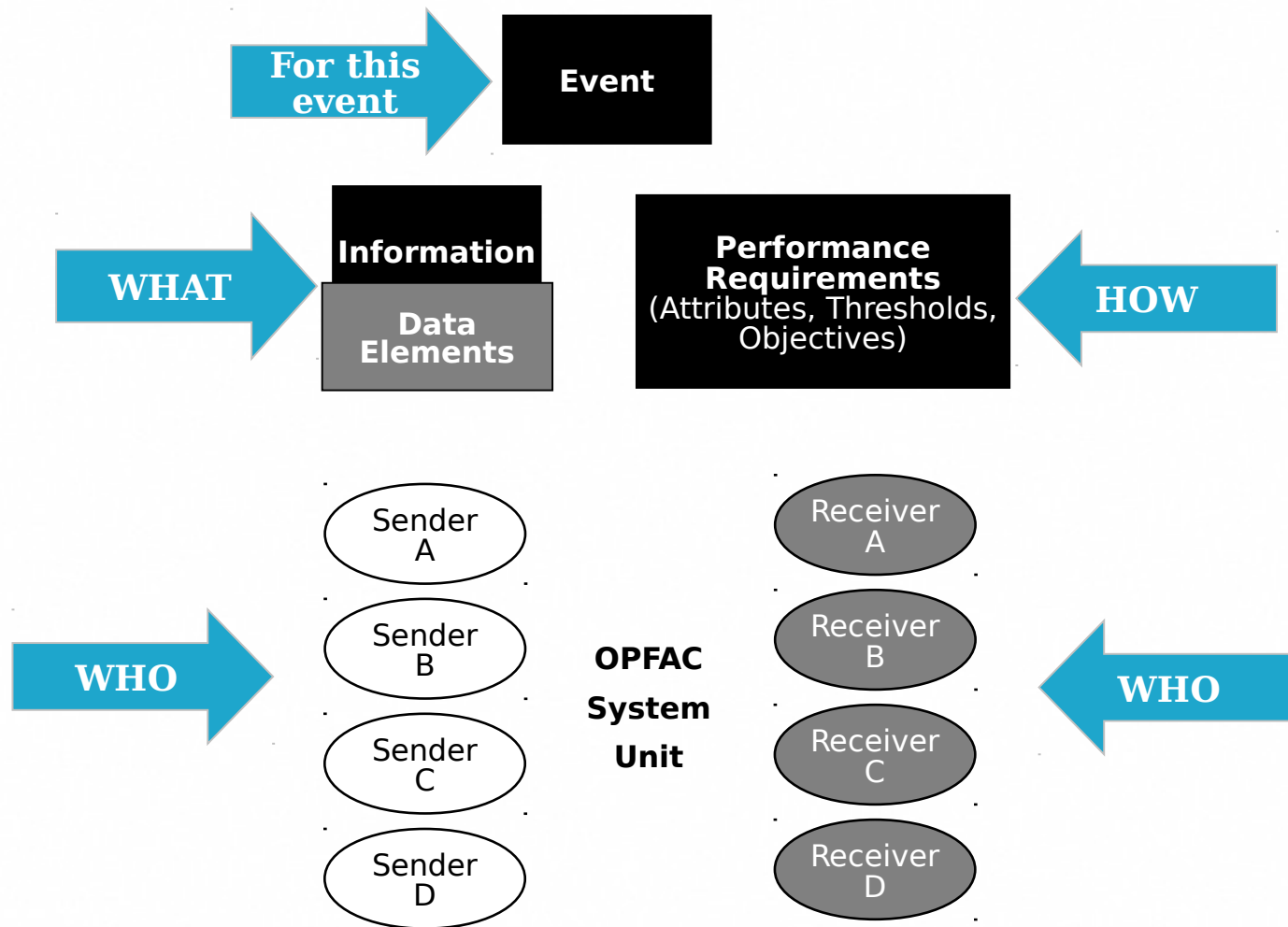


# So...What Else Is an IER?

- IER is a **Condition of Success** for a requirement
- It is a requirement, but what is desired result of the requirement?
  - **Transmission?**
  - **Reception?**
- Cannot be generally understood with single threads
- IERs are detailed pictures of how a System-of-Systems or Family-of-Systems should work to support specific transactions within an event
- IERs are statements of why information is needed and operational context in which to place the data elements
- The connection between system and operational architecture
  - **If properly formulated, the IER makes system architecture relevant**

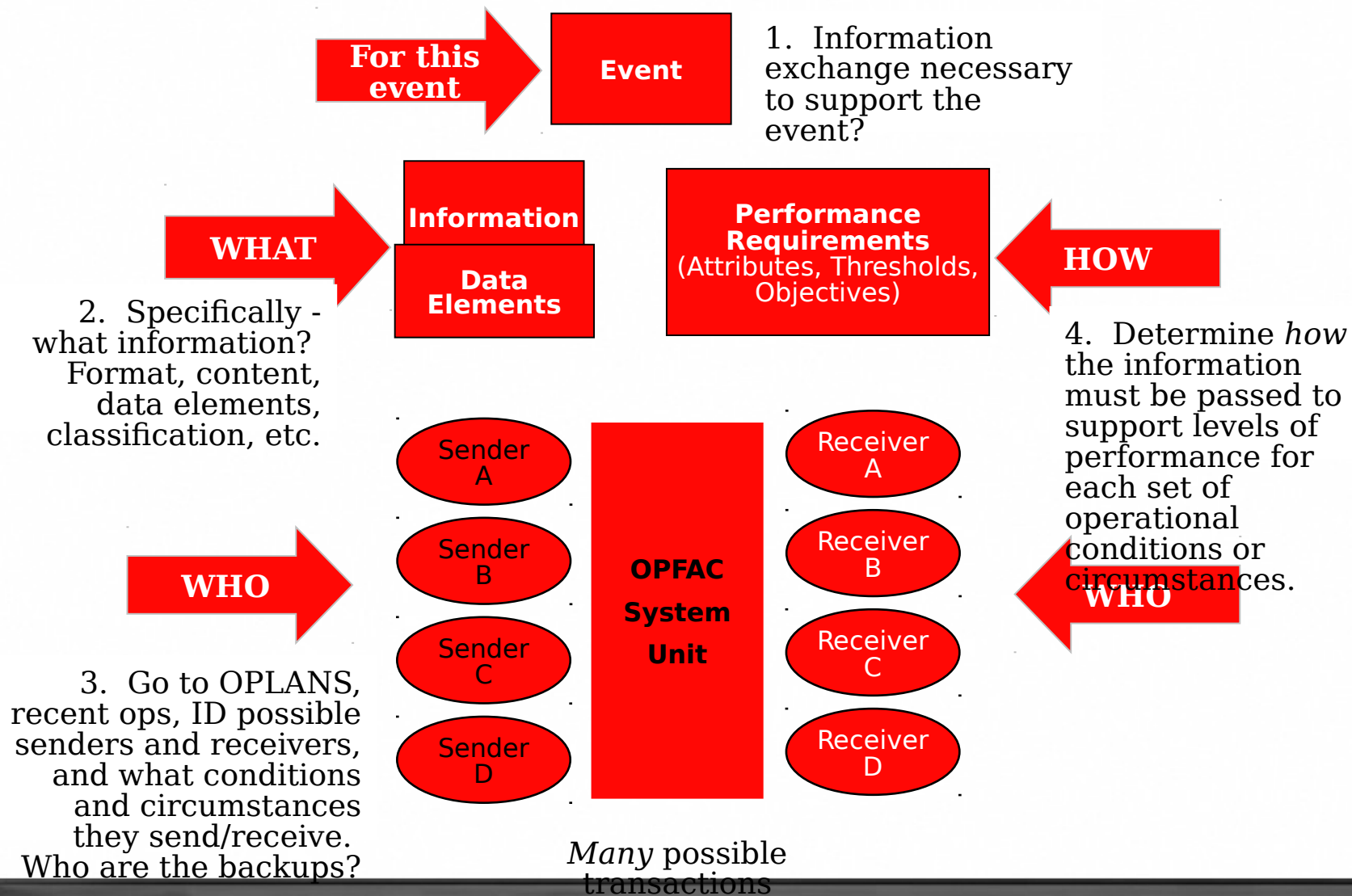


# Information Exchange Requirements



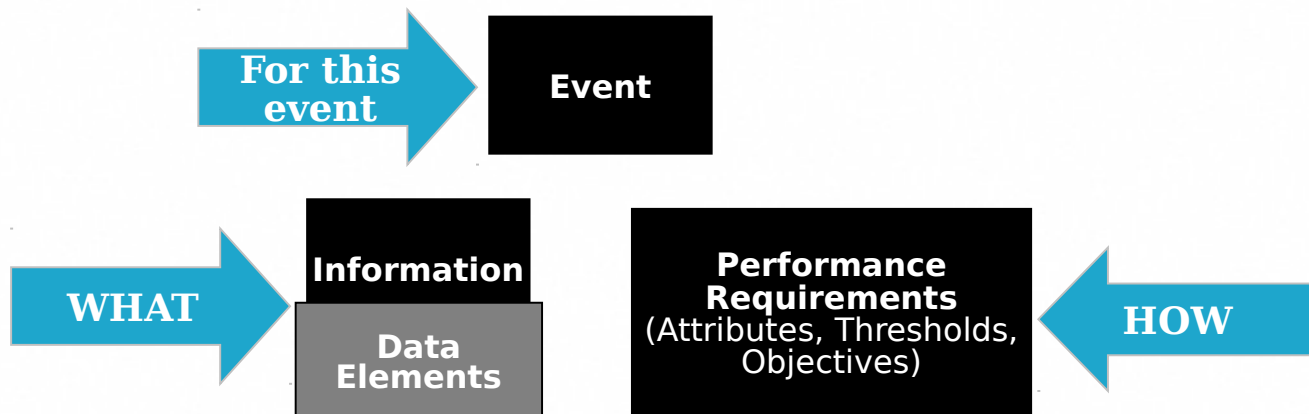


# Information Exchange Requirements

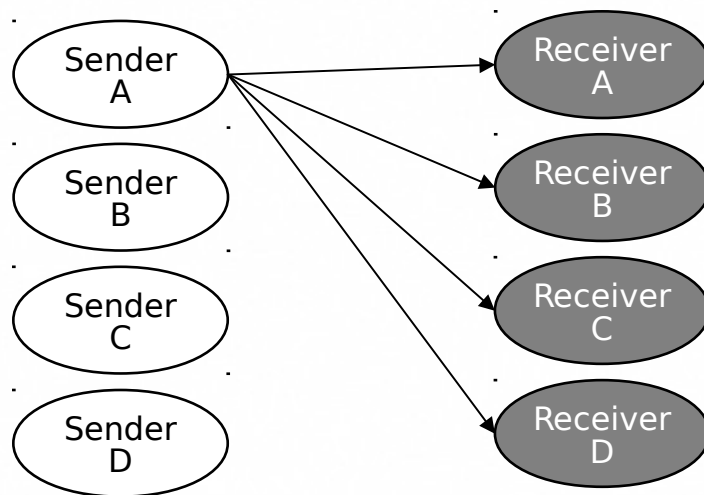




# Information Exchange Requirements



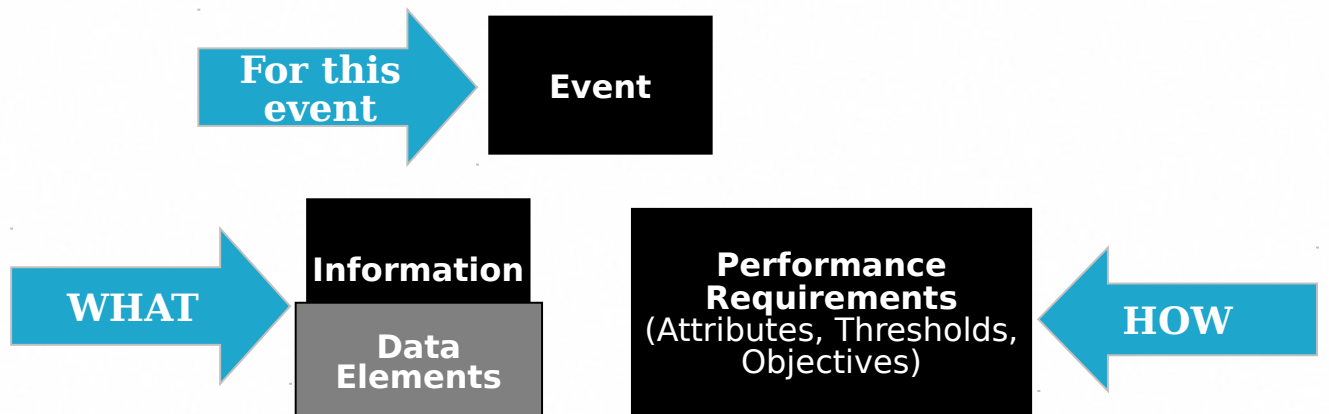
- Are multiple senders transmitting the same information simultaneously?
- Is redundancy a factor?
- Are there designated primary and backup receivers?
- What are system assets and abilities for each sender possess?



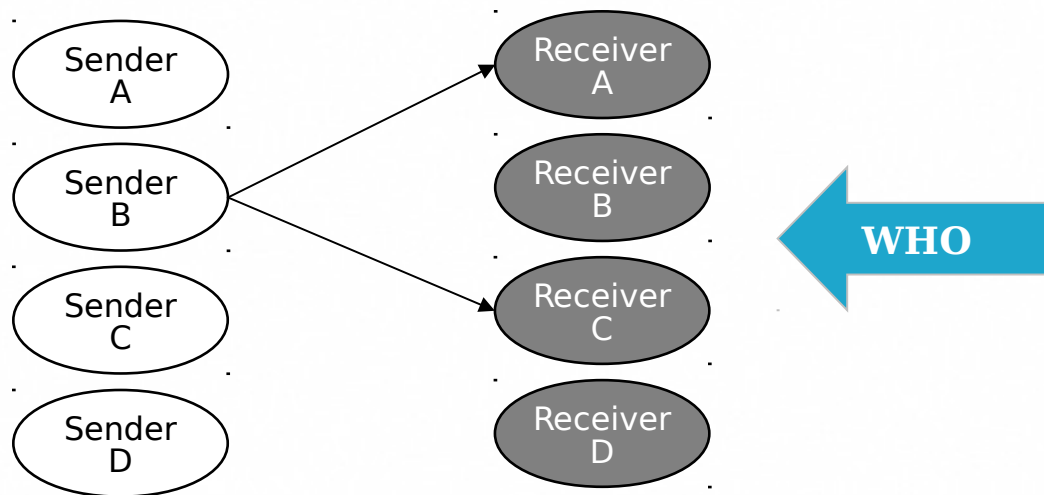
Many possible transactions



# Information Exchange Requirements



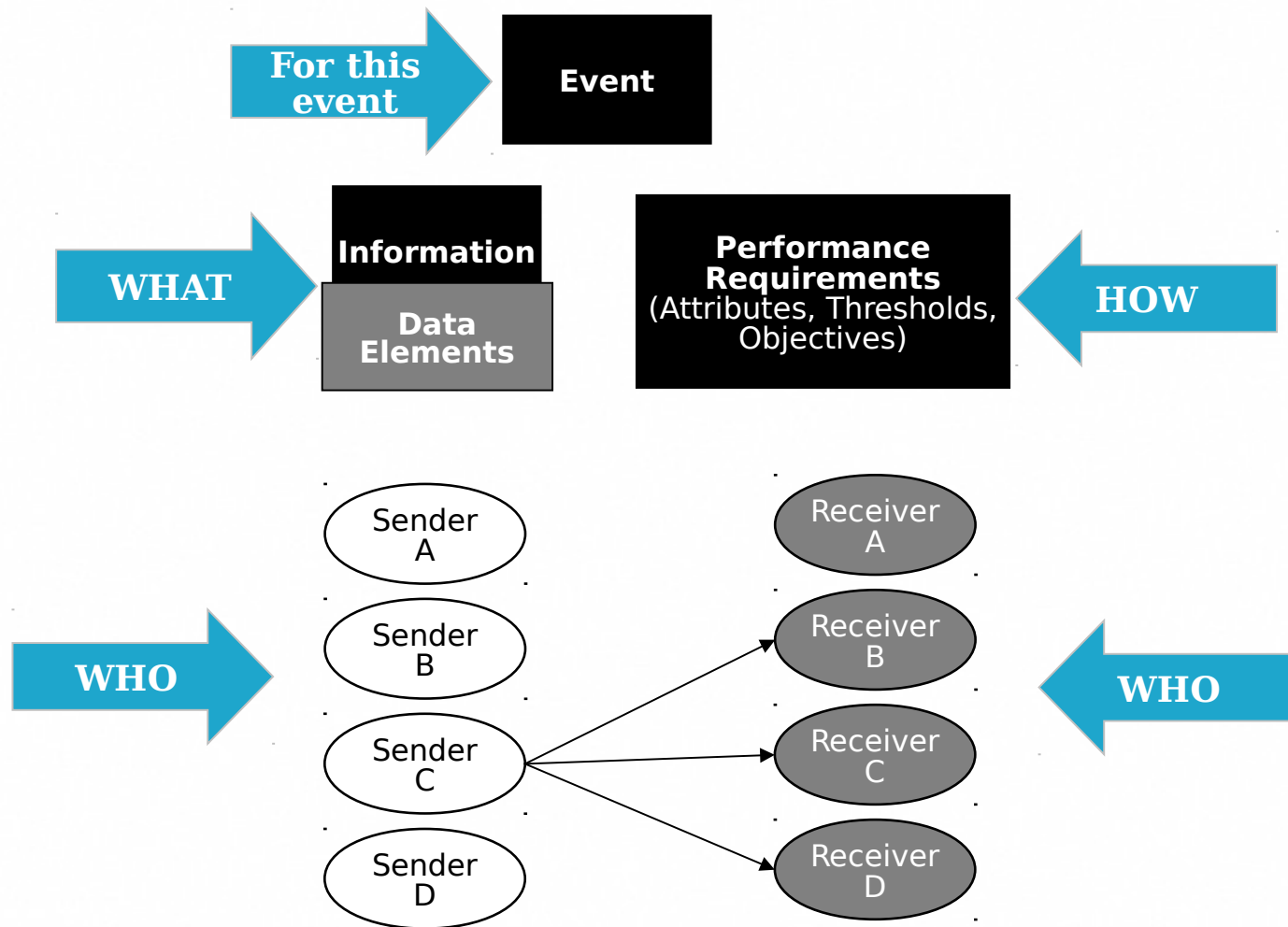
- Any recent performance indicators for this event?
- Think about reasonable contingencies - *"what if"* scenarios.



Many possible transactions



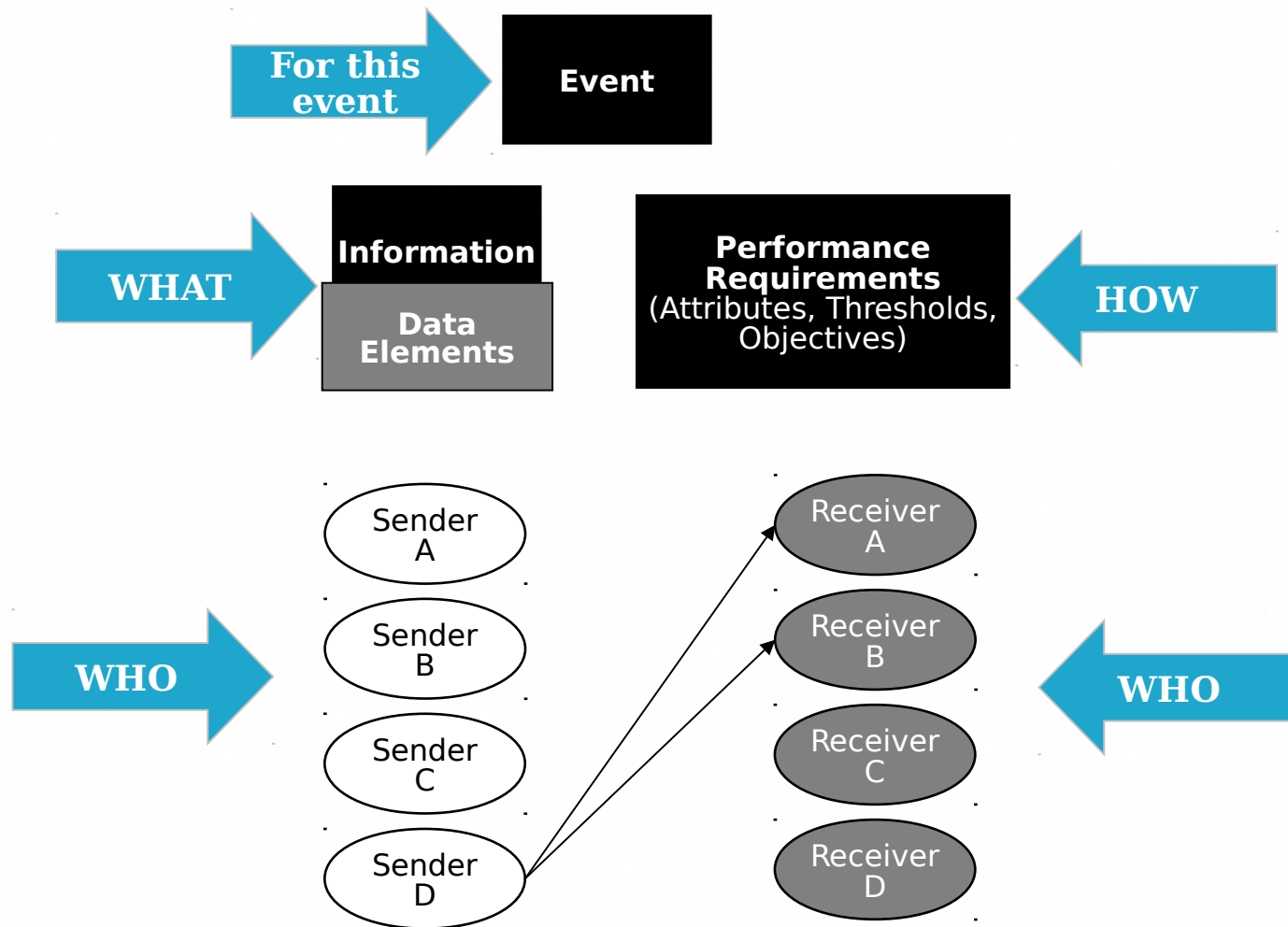
# Information Exchange Requirements



*Many possible transactions*



# Information Exchange Requirements



*Many possible transactions*



# Information Exchange Requirements

What's the real requirement?

That ALL senders transmit to all receivers meeting thresholds and/or objectives for all required attributes?

OR

That receivers receive the information in a manner to satisfy threshold or objective values?

How many senders will ensure the requirement is met?

Which senders under what conditions?

| Event    | Information   |            | Performance Requirements<br>(Attributes, Thresholds, Objectives) |            |
|----------|---------------|------------|------------------------------------------------------------------|------------|
|          | Data Elements |            |                                                                  |            |
|          | Receiver A    | Receiver B | Receiver C                                                       | Receiver D |
| Sender A | X             | X          | X                                                                | X          |
| Sender B | X             |            | X                                                                |            |
| Sender C |               | X          | X                                                                | X          |
| Sender D | X             | X          |                                                                  |            |

Many possible transactions



# Information Exchange Requirements

**Event**

**Information**

**Data  
Elements**

**Performance  
Requirements**

(Attributes, Thresholds,  
Objectives)

|          | Receiver A  | Receiver B  | Receiver C  | Receiver D  |
|----------|-------------|-------------|-------------|-------------|
| Sender A | System path | System path | System path | System path |
| Sender B | System path |             | System path |             |
| Sender C |             | System path | System path | System path |
| Sender D | System path | System path |             |             |

*Representing IERs in this manner  
bridges requirements to support  
plans. This works for all transactions -  
not just IERs!*



# IER Pre-requisites?

| Function | Planning Activities | Coordination Activities | Execution Activities | Types Systems | Army C   KF | AF C   KF | Navy C   KF | MC C   KF | Joint C   KF | Interoperability Issues |
|----------|---------------------|-------------------------|----------------------|---------------|-------------|-----------|-------------|-----------|--------------|-------------------------|
|          |                     |                         |                      |               |             |           |             |           |              |                         |
|          |                     |                         |                      |               |             |           |             |           |              |                         |
|          |                     |                         |                      |               |             |           |             |           |              |                         |
|          |                     |                         |                      |               |             |           |             |           |              |                         |
|          |                     |                         |                      |               |             |           |             |           |              |                         |
|          |                     |                         |                      |               |             |           |             |           |              |                         |
|          |                     |                         |                      |               |             |           |             |           |              |                         |
|          |                     |                         |                      |               |             |           |             |           |              |                         |
|          |                     |                         |                      |               |             |           |             |           |              |                         |
|          |                     |                         |                      |               |             |           |             |           |              |                         |

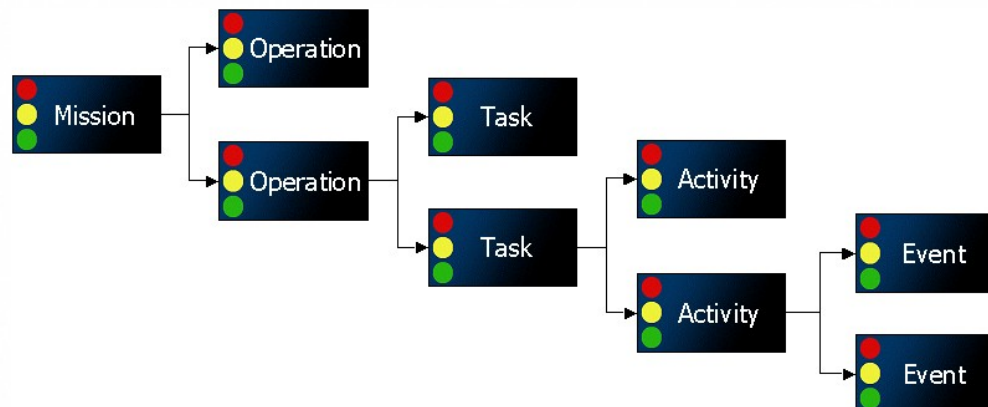
System Candidates

1

**ID your system candidates.  
Know your Family-of-Systems.**

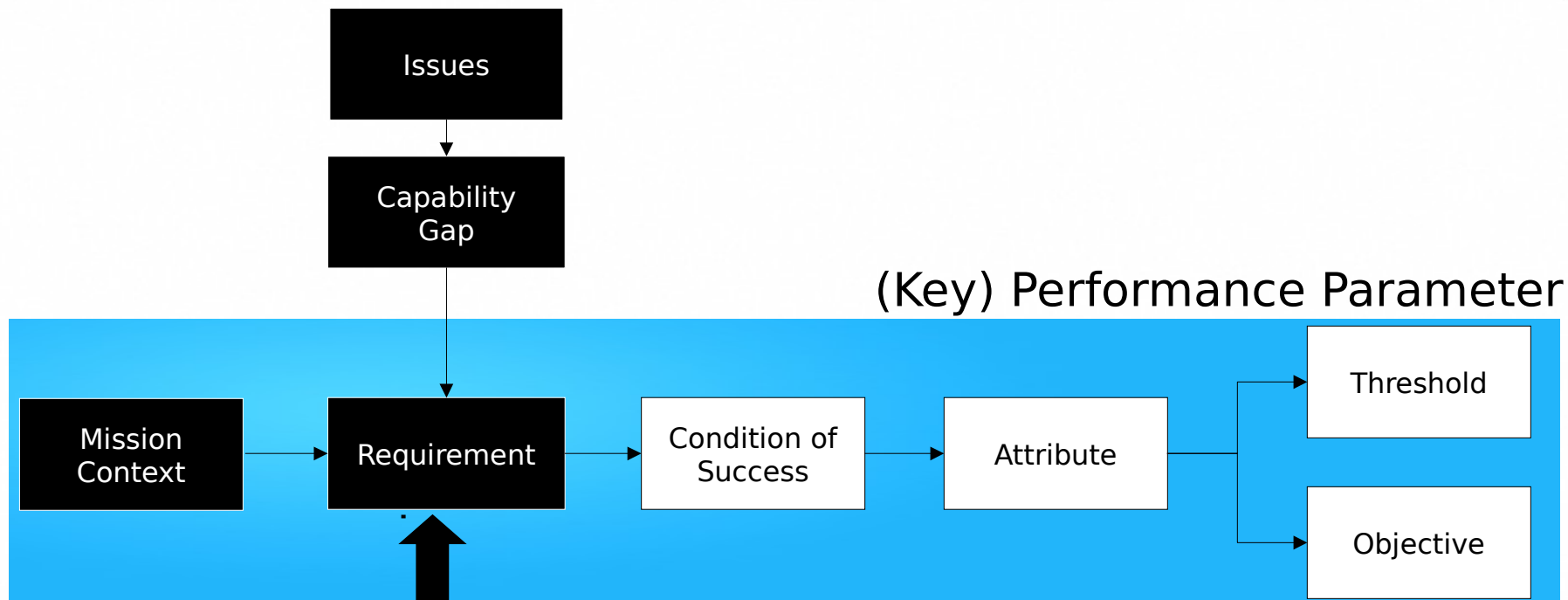
2

**Know your mission context.**





# IER Pre-requisites?

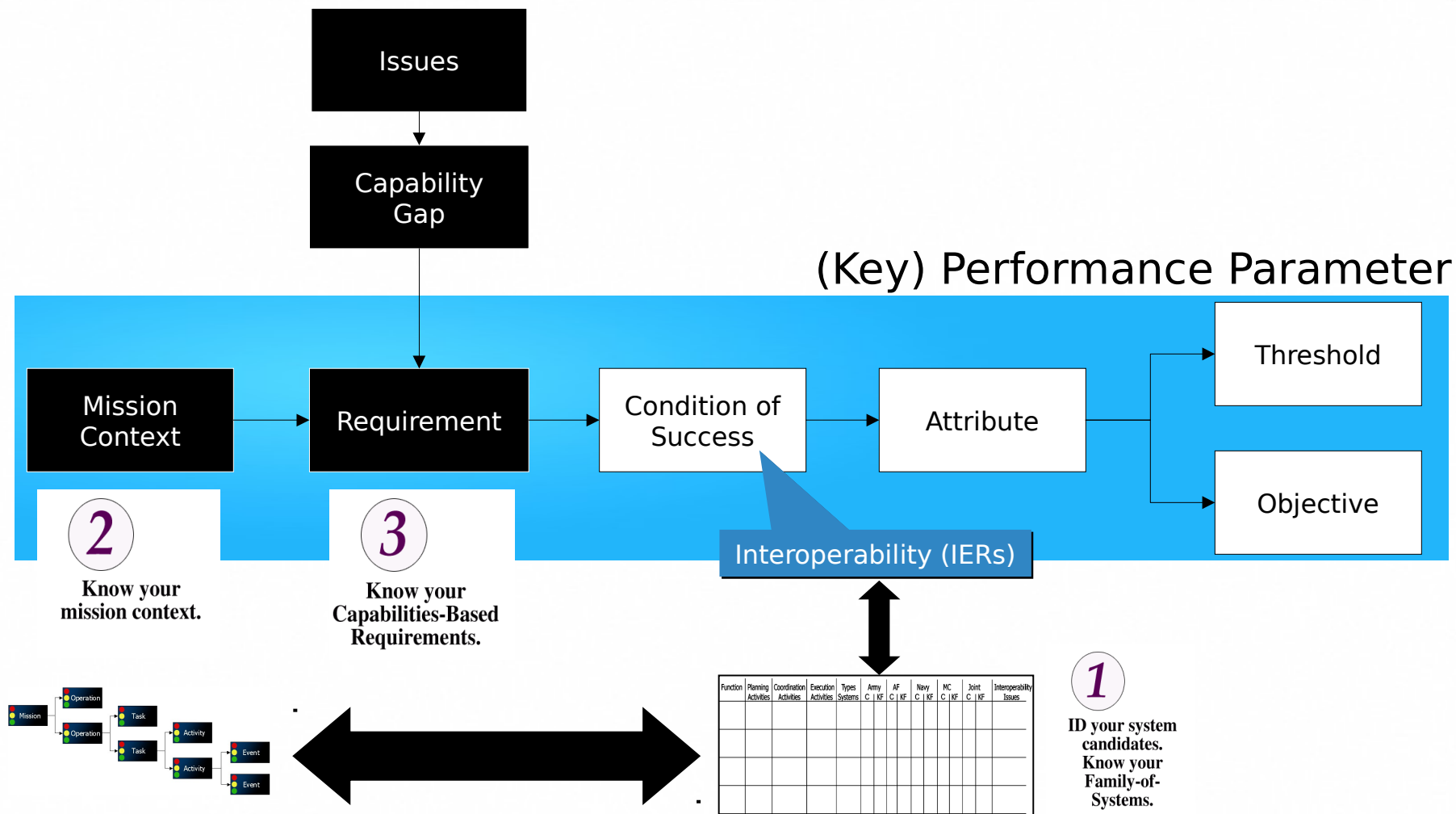


3

**Know your  
Capabilities-Based  
Requirements.**

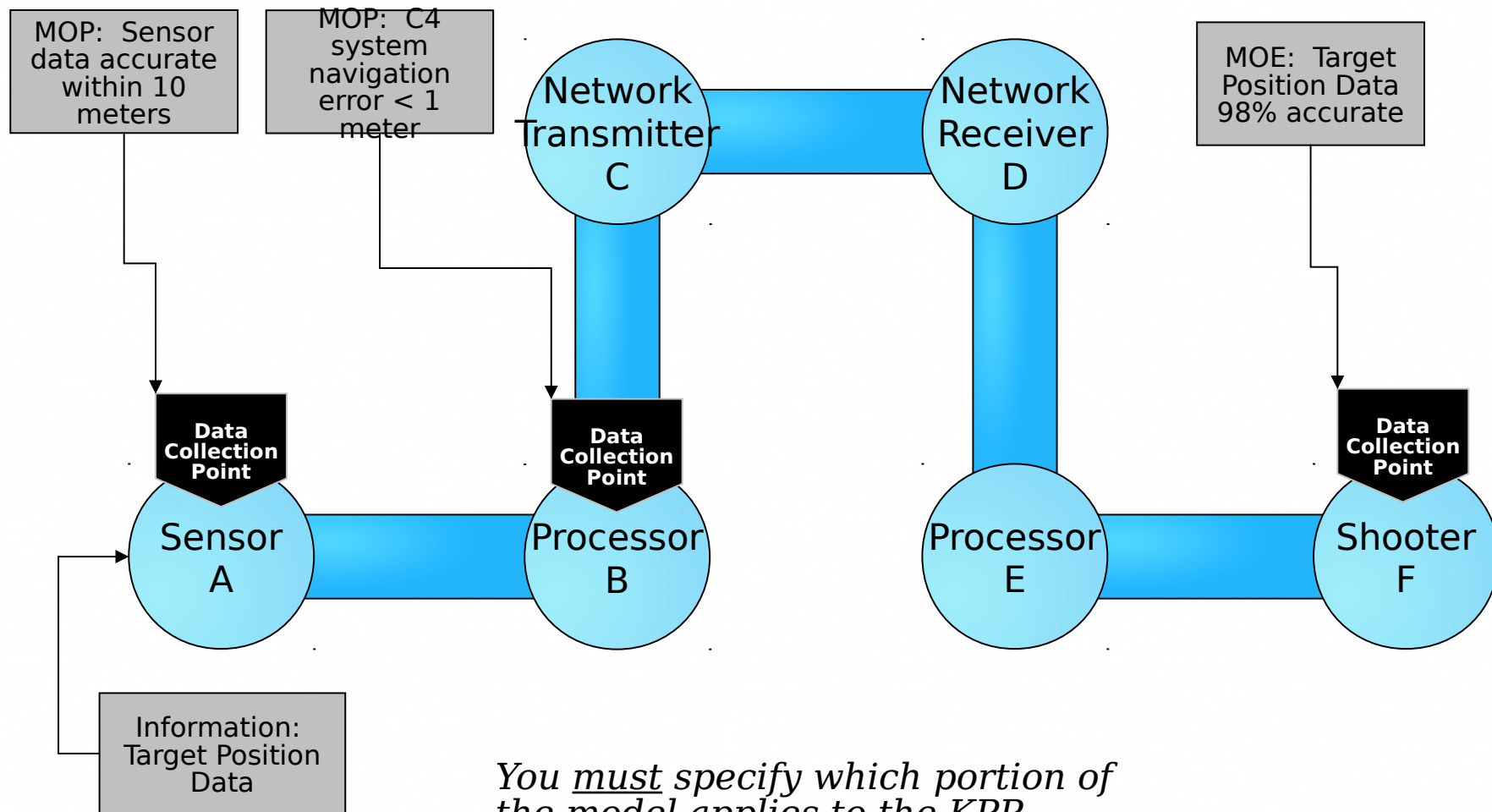


# IER Pre-requisites?





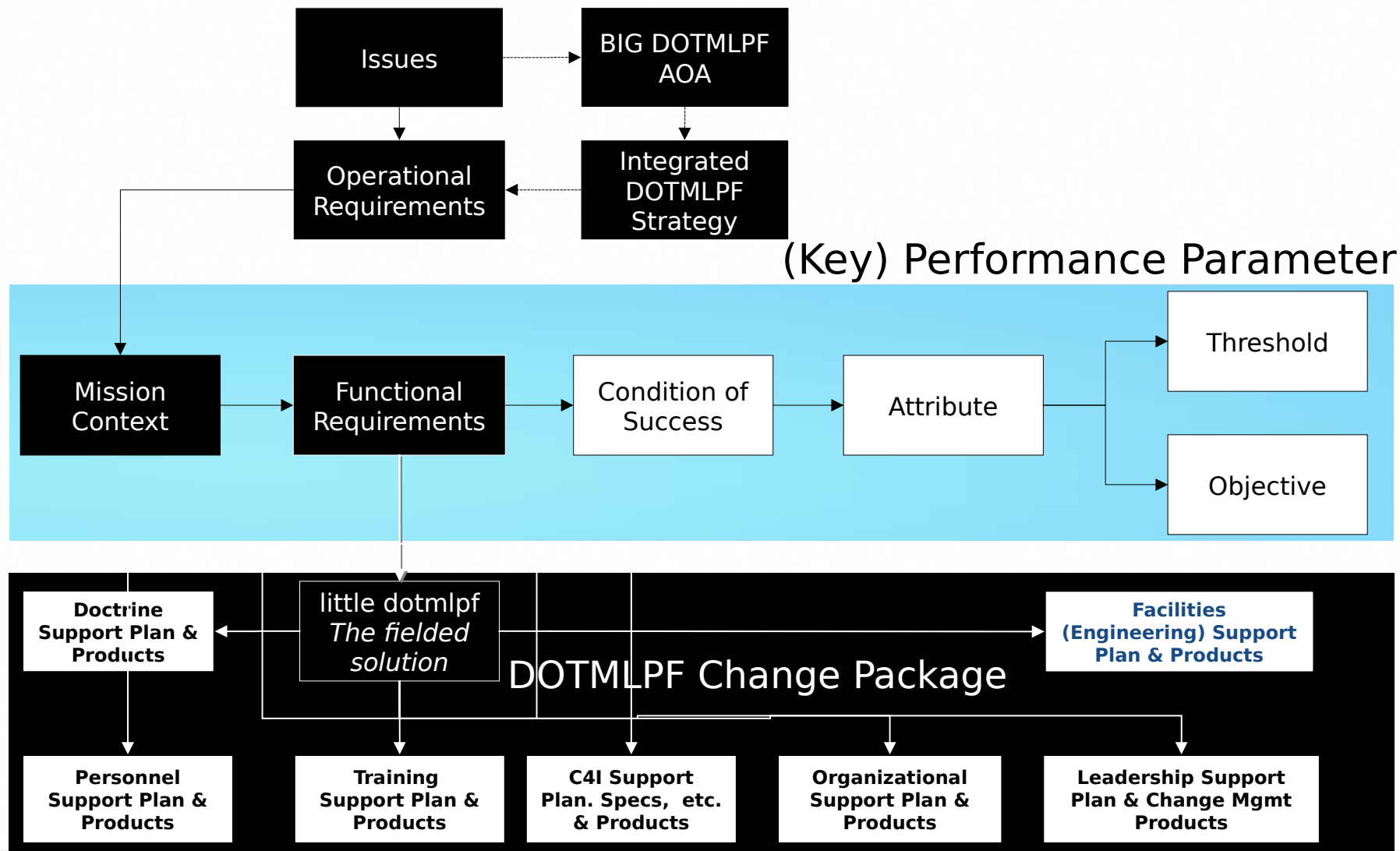
# Attribute Characterization Model



*You must specify which portion of the model applies to the KPP thresholds and objectives.*

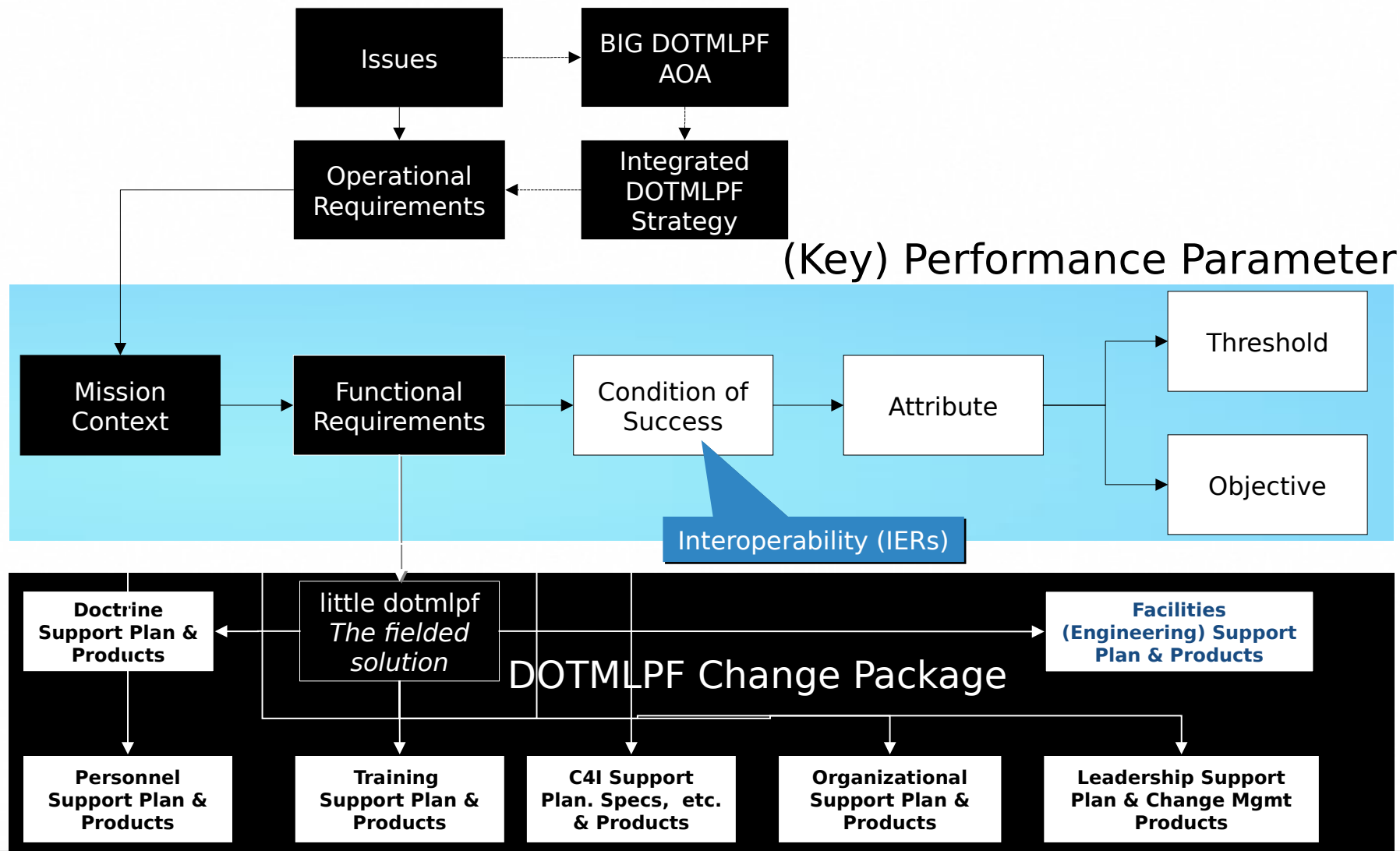


# FCB Oversight



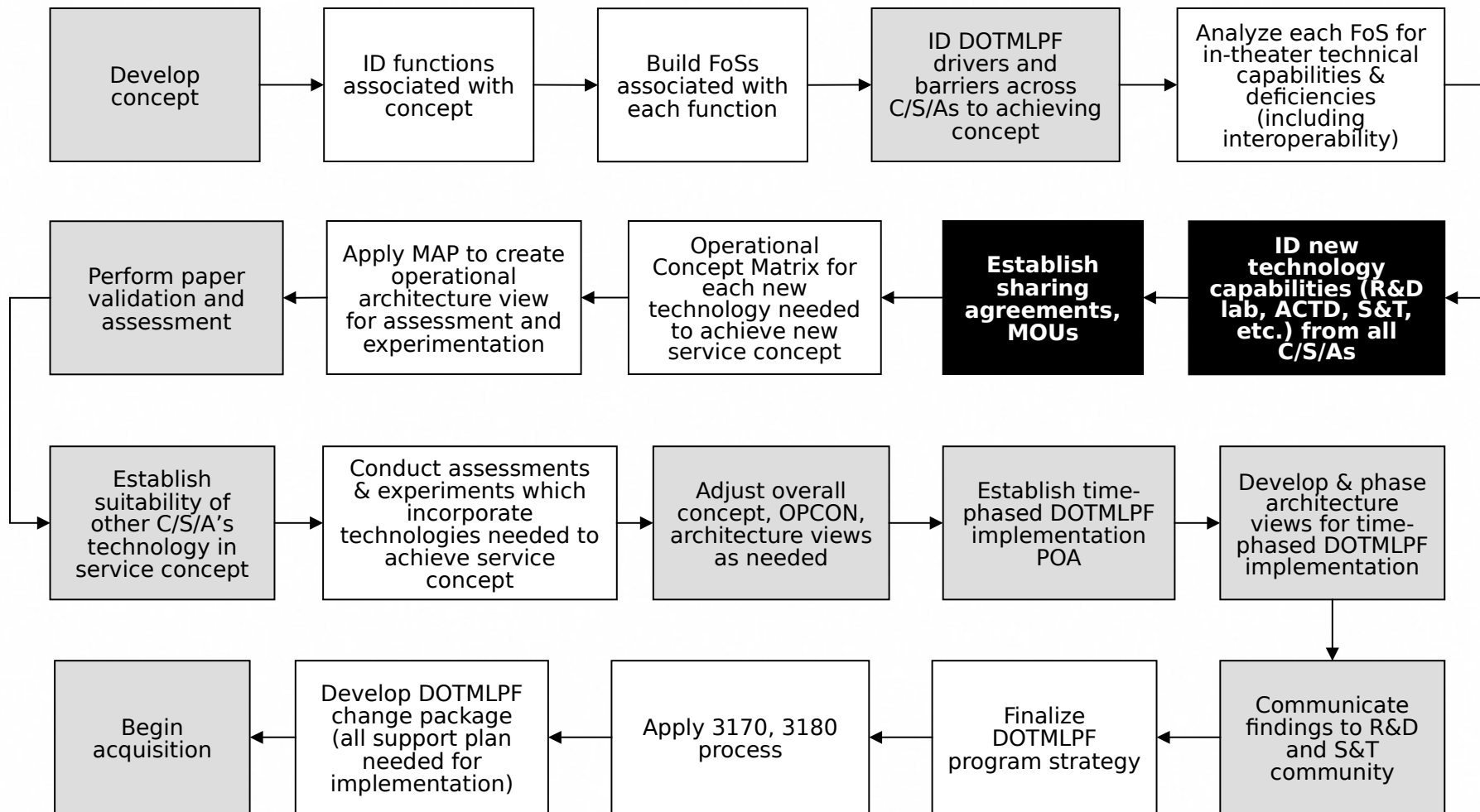


# FCB Oversight





# DOTMLPF Adaptation





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